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MAINTENANCE AND SERVICE GUIDE

Compaq ProLiant 2500 Family of Servers

First Edition (October 1996)
Part Number 281834-001

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Preface
About This Guide

This *Maintenance and Service Guide* is a troubleshooting guide that can be used for reference when servicing the Compaq ProLiant 2500 Family of Servers. Only authorized technicians trained by Compaq should attempt to repair this equipment.

Compaq Computer Corporation reserves the right to make changes to Compaq ProLiant 2500 and 2500R Servers without notice.

Many of the illustrations used in this guide show only the Compaq ProLiant 2500. You can also refer to these illustrations when servicing the Compaq ProLiant 2500R. Separate illustrations are provided where necessary.

Symbols

The following text and symbols mark special messages throughout this guide:

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of data.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Technician Notes

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WARNING: Only authorized technicians trained by Compaq should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indications of component replacement or printed wiring board modifications may void any warranty.

CAUTION: To properly ventilate your system, you must provide at least 12 inches (30.48 cm) of clearance at the front and back of the computer.

CAUTION: The computer is designed to be electrically grounded. To ensure proper operation, plug the AC power cord into a properly grounded AC outlet only.

Locating Additional Information

The following documentation is available to support these products:

- User Documentation
- *Compaq Service Quick Reference Guide*
- Service Training Guides
- *Compaq Service Advisories and Bulletins*
- *Compaq QuickFind*
- Compaq Insight Manager

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Chapter 1
Illustrated Parts Catalog

This chapter provides the illustrated parts breakdown and a spares parts list for the Compaq ProLiant 2500 Family of Servers.

Mechanical Parts Exploded View

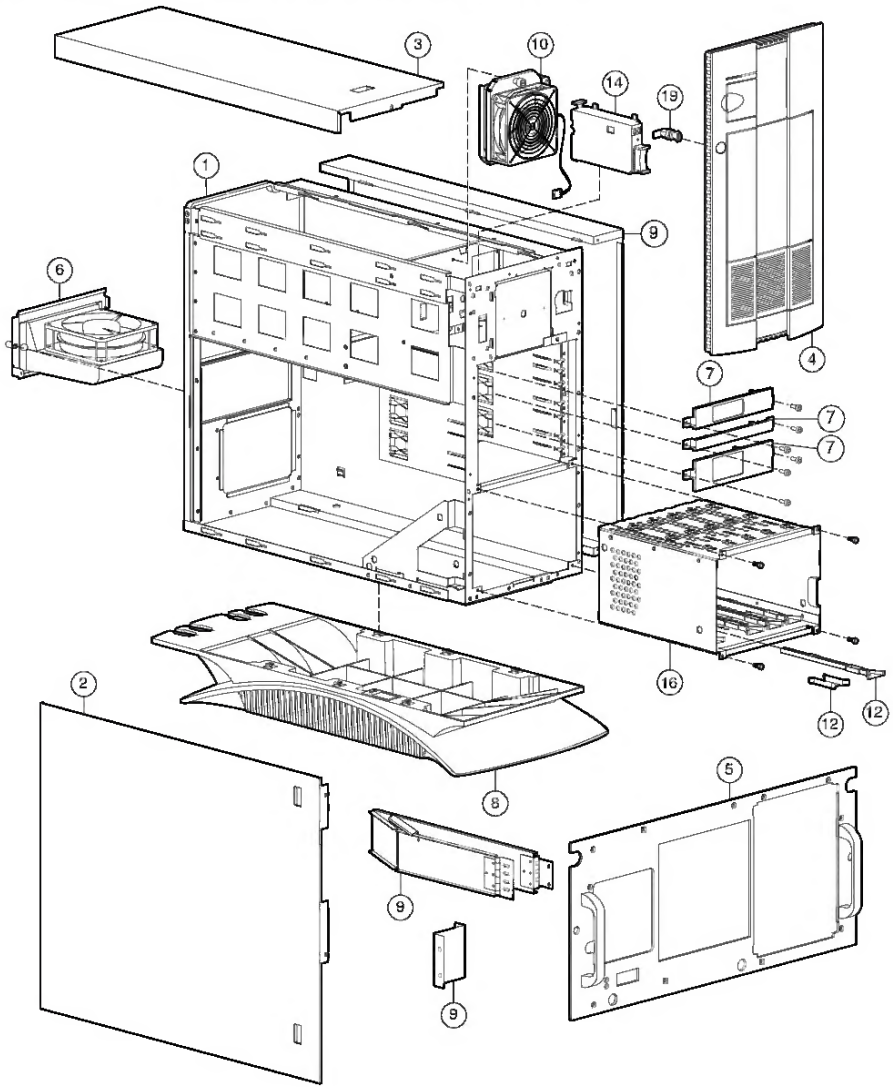

Figure 1-1. Exploded View of the Compaq ProLiant 2500 and 2500R Server Mechanical Parts

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System Components Exploded View

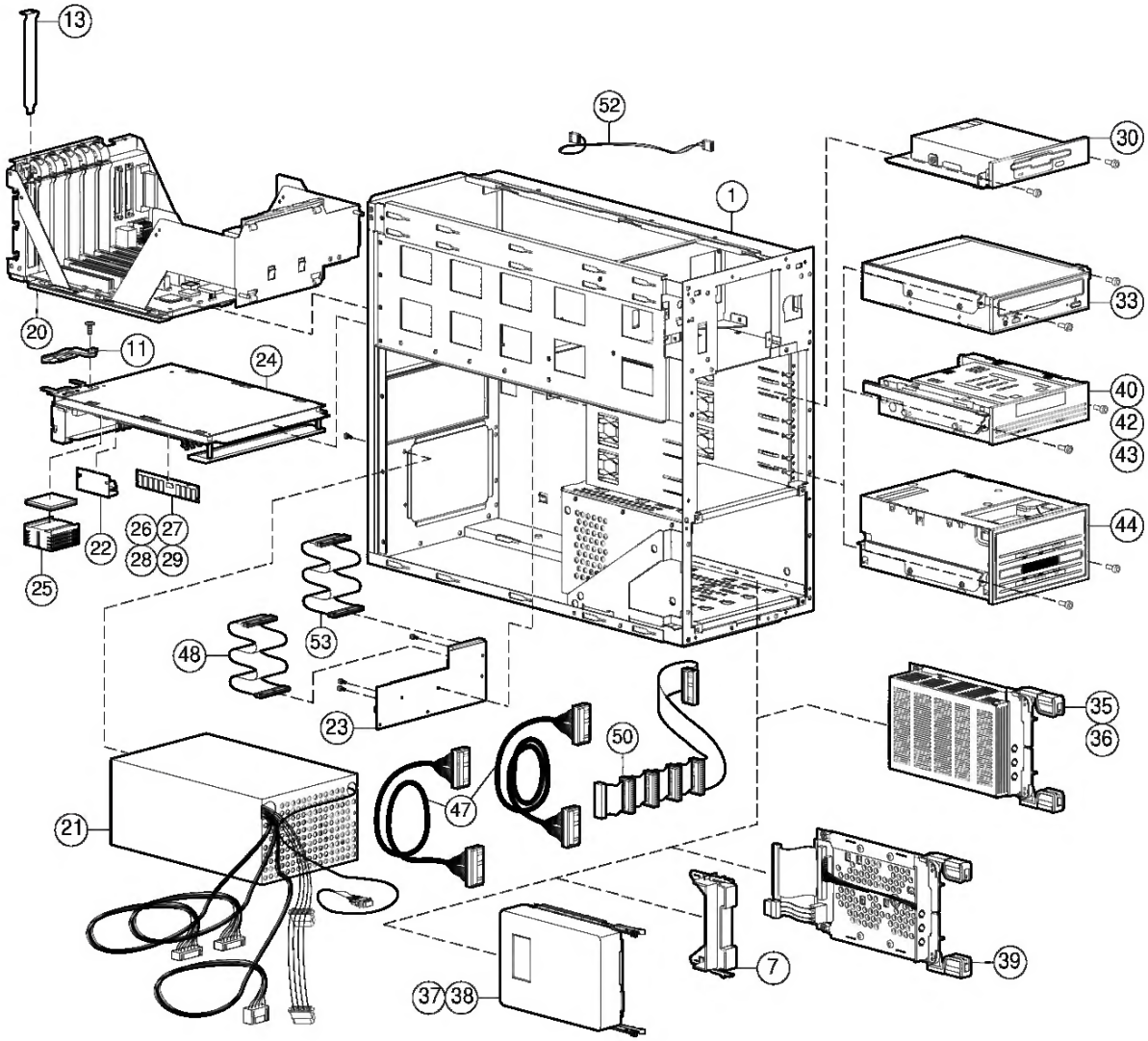

Figure 1-2. Exploded View of the Compaq ProLiant 2500 and 2500R Server System Components

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Spares Parts List

The Compaq ProLiant 2500 is a tower server. The Compaq ProLiant 2500R is a rack-mountable server. Spares that are unique to the tower or rack models are noted in Table 1-1.

Table 1-1
Spares Parts List - Compaq ProLiant 2500 and 2500R Servers

Item	Description	Spares Part #
CHASSIS		
1	Chassis	271917-001
2	Large Panel (Side panel in Compaq ProLiant 2500, top panel in 2500R)	281846-001
3	Small Panel (Top panel in Compaq ProLiant 2500, side panel in 2500R)	271926-001
4	Front Bezel Door (Compaq ProLiant 2500 only)	271923-001
5	Front Bezel (Compaq ProLiant 2500R only)	271924-001
6	Processor Fan and Cage	271919-001
7	Bezel Kit (1/6, 1/3, 1/2 Height - Qty 5 each) and Empty Hot-Pluggable Drive Cover	189917-001
8	Base (Compaq ProLiant 2500 only)	271940-001
9	Base Pan/Rack Conversion Kit (Compaq ProLiant 2500R only)	271927-001
10	System I/O Fan	281844-001
11	Ejector for Processor Board Tray	271933-001
12	Drive Guide and Ground Spring (Qty 5 each)	146771-001
13	Slot Covers, Clips (Qty 6)	271918-001
14	Power Switch (Push Button)	271929-001
15	Logo Kit (Qty 2)	250907-001 *
ASSEMBLIES		
16	Hot-Pluggable Drive Cage w/ Backplane Board (5 x 1-inch drives)	250911-001
17	Hot-Pluggable Drive Cage w/ Backplane Board (Duplexed)	271932-001
18	Non-Hot-Pluggable Drive Cage (Compaq ProLiant 2500 only)	271922-001
19	Key-Lock Assembly	148725-001
20	System I/O Board Tray Assembly	271953-001

Continued

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Spares Parts List - Compaq ProLiant 2500 and 2500R Servers *Continued*

Item	Description	Spares Part #
SYSTEM	**COMPONENTS**	
21	Power Supply	271916-001
	BOARDS	
22	Processor Power Module	271935-001
23	System I/O and Processor Backplane Board	250908-001
24	P6/200 MHz Board Tray	271914-001
25	P6/200 MHz Processor Chip with Heatsink	271942-001
	MEMORY	
26	32-MB DIMM EDO/B (60ns)	281857-001
27	64-MB DIMM EDO/B (60ns)	281858-001
28	128-MB DIMM EDO/B (60ns)	281859-001
29	256-MB DIMM EDO/B (60ns)	281860-001
	MASS STORAGE	
30	1.44 MB, 3.5-inch Diskette Drive (Standard)	144207-201
31	1.44 MB, 3.5-inch Diskette Drive (Option)	112565-001 *
32	Caddy Load CD-ROM Drive	133881-001 *
33	Tray Load Quad-Speed CD-ROM Drive	184783-001
34	2-GB, 1-inch Fast-Wide SCSI-2 Drive	199878-001 *
35	2.1-GB Pluggable Fast-Wide SCSI-2 Drive	199643-001
36	4.3-GB Pluggable Fast-Wide SCSI-2 Drive	199598-001
37	4.3-GB Non-Pluggable Fast-Wide SCSI-2 Drive	199599-001
38	2.1-GB Non-Pluggable Fast-Wide SCSI-2	199644-001
39	Hot-Pluggable Tray Adapter (Fast-Wide SCSI-2)	199656-001
40	525-MB ACA Tape Drive	142073-201
41	1.2-GB Tape Drive	199615-201 *
42	2/8-GB DAT Drive	142074-201
43	4/16-GB TurboDAT Drive	199464-201
44	4/16-GB TurboDAT Autoloader	199466-201
45	10/20-GB DLT Drive	199746-001 *
46	15/30-GB DLT Drive	242468-001 *

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Spares Parts List - Compaq ProLiant 2500 and 2500R Servers *Continued*

Item	Description	Spares Part #
	CABLE KITS	
47	Wide SCSI Cable (18-inch and 36-inch)	271937-001
48	Diskette Cable	271928-001
49	Diskette/CD-ROM Power Cable	271939-001 *
50	SCSI Cable (non-Hot-Pluggable)	271954-001
51	Power Cable (non-Hot-Pluggable)	250906-001
52	Fan Cable	271920-001
53	IDE/CD-ROM Cable	271936-001
54	Parallel Cable	271938-001 *
	KEYBOARDS	
55	Keyboard, U.S. English	160648-101 *
56	Keyboard, U.K. English	160648-103 *
57	Keyboard, German	160648-104 *
58	Keyboard, French	160648-105 *
59	Keyboard, Italian	160648-106 *
60	Keyboard, Spanish	160648-107 *
61	Keyboard, Danish	160648-108 *
62	Keyboard, Norwegian	160648-109 *
63	Keyboard, Swedish/Finnish	160648-110 *
64	Keyboard, Swiss	160648-111 *
65	Keyboard, French Canadian	160648-112 *
66	Keyboard, Portuguese	160648-113 *
67	Keyboard, Turkish	160648-114 *
68	Keyboard, Greek	160648-115 *
69	Keyboard, Latin American	160648-116 *
70	Keyboard, Arabic	160648-117 *
71	Keyboard, Belgian	160648-118 *
72	Keyboard, BHCSY	160648-120 *
73	Keyboard, Hungary	160648-121 *
74	Keyboard, Polish	160648-122 *
75	Keyboard, Slovakia	160648-123 *
76	Keyboard, Russia	160648-124 *
77	Keyboard, Czech	160648-129 *

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Spares Parts List - Compaq ProLiant 2500 and 2500R Servers *Continued*

Item	Description	Spares Part #
	MISCELLANEOUS	
78	Miscellaneous Hardware Kit	281847-001 *
79	System ROMpaq	143198-001 *
80	Option ROMpaq	142207-001 *
81	System I/O Battery	160274-001 *
82	Compaq SmartStart CD	183969-001 *
83	Compaq Systems Reference Library CD	183163-001 *
	OPTIONS	
84	SMART Controller	142130-001 * 181132-001 *
85	SMART-2/E Controller	194752-001 *
86	SMART-2/P Controller	194754-001 *
87	Fast-SCSI-2/E Controller	142040-001 *
88	32-Bit Fast-Wide SCSI-2/E Controller	199634-001 *
89	32-Bit Fast-Wide SCSI-2/P Controller	199633-001 *
90	NetFlex Controller	142041-001 *
91	NetFlex Controller Token Ring Module	142042-001 *
92	NetFlex-2 Ethernet/Token Ring Controller	142222-001 *
93	NetFlex-2 DualPort Ethernet Controller	142151-001 *
94	NetFlex-2 Token Ring Controller	199521-001 *
95	NetFlex-2 DualPort Token Ring Controller	142195-001 *
96	NetFlex-3/E Controller	169801-001 *
97	NetFlex-3/P Controller	169811-001 *
98	NetFlex-3 100 Base-TX Upgrade Module	169805-001 *
99	NetFlex-3 100 VG-AnyLAN Upgrade Module	169803-001 *
100	10/100 TX PCI UTP Controller	169849-001 *
101	10 T, PCI UTP Controller	242501-001 *
102	4/16 TR PCI IBM UTP/STP Controller	199764-001 *
103	50-Pin to 68-Pin Adapter (Standard to Wide)	189638-001 *
104	68-Pin to 50-Pin Adapter (Wide to Standard)	189631-001 *
105	NIC 10/100 Class B	219414-001 *

* Not Shown

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Chapter 2
Removal and Replacement Procedures

This chapter provides subassembly/module-level removal and replacement procedures for the Compaq ProLiant 2500 and Compaq ProLiant 2500R Servers. After completing all necessary removal and replacement procedures, run the DIAGNOSTICS program to verify that all components operate properly.

To service Compaq ProLiant 2500 and 2500R Servers, you might need:

- Torx T-15 screwdriver
- From the Compaq SmartStart and Support Software CD:
  - System Configuration Utility software
  - Drive Array Advanced Diagnostics software
  - Diagnostics software

The Compaq ProLiant 2500 is a tower server. The Compaq ProLiant 2500R is a rack-mountable server. The models are identical except for their orientation: on the tower model, the chassis is upright; on the the rack-mountable model, the chassis is on its side.

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Electrostatic Discharge Information

A discharge of static electricity can damage static-sensitive devices or microcircuitry. Proper packaging and grounding techniques are necessary precautions to prevent damage. To prevent electrostatic damage observe the following precautions:

- Transport products in static-safe containers such as conductive tubes, bags, or boxes.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.
- Cover work stations with approved static-dissipating material. Provide a wrist strap connected to the work surface and properly grounded tools and equipment.
- Keep work area free of non-conductive materials such as ordinary plastic assembly aids and foam packing.
- Always be properly grounded when touching a static-sensitive component or assembly.
- Avoid touching pins, leads or circuitry.
- Always place drives PCB assembly side down on the foam.
- Use conductive field service tools.

Symbols in Equipment

WARNING: Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists. To avoid risk of injury from a hot component, allow the surface to cool before touching.

WARNING: Any surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts. To avoid risk of injury from electrical shock hazards, do not open this enclosure.

WARNING: Any RJ-45 receptacle marked with these symbols indicates a Network Interface Connection. To avoid risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

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Preparation Procedures

Before beginning any of the removal and replacement procedures, complete the following steps:

1. Turn OFF the server and any peripheral devices.
2. Disconnect the AC power cord from the AC outlet, then from the server.
3. Disconnect all external peripheral devices from the server.

Front Bezel

On the Compaq ProLiant 2500 Server, the front bezel is a door. On the Compaq ProLiant 2500R Server, the front bezel is a plate.

Compaq ProLiant 2500

WARNING: High voltage present. Extreme care must be taken when running the Compaq ProLiant 2500 Server without the system unit cover on.

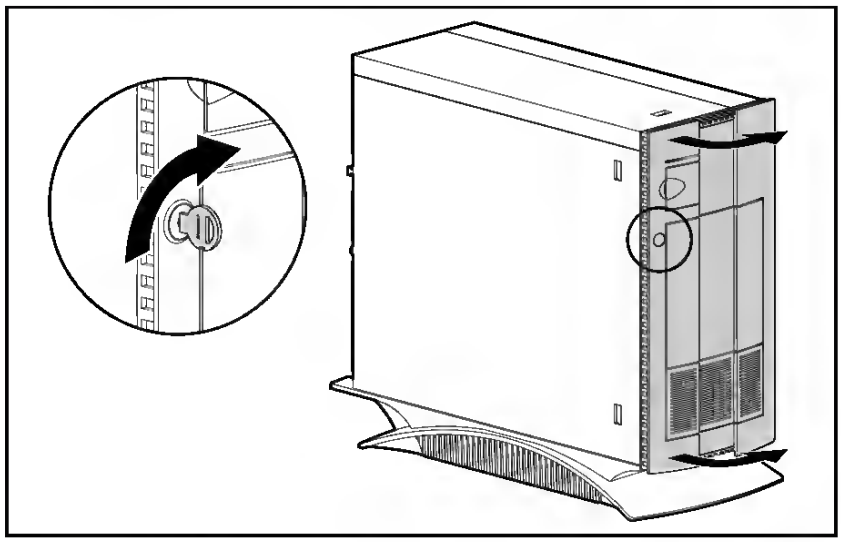

Figure 2-1. Opening Front Bezel Door

1. Unlock the front bezel and swing open the door.

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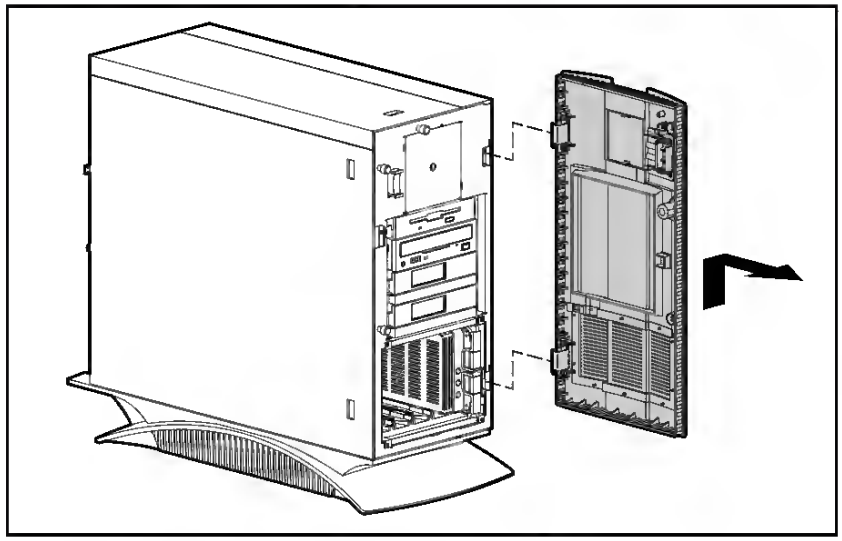

Figure 2-2. Removing the Front Bezel Door

2. Lift and remove the door.

Reverse steps 1 to 2 to replace the front bezel door.

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Compaq ProLiant 2500R

WARNING: High voltage present. Extreme care must be taken when running the Compaq ProLiant 2500R Server without the system unit cover on.

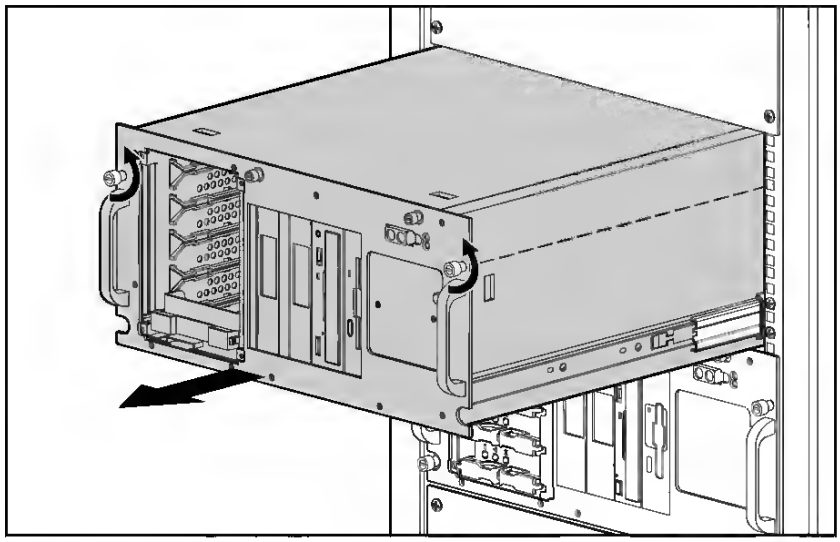

Figure 2-3. Extending the Server from the Rack

1. Unscrew the front panel thumb screws to release the server from the rack.
2. Using the handles, pull the server out from the rack to the locked position.

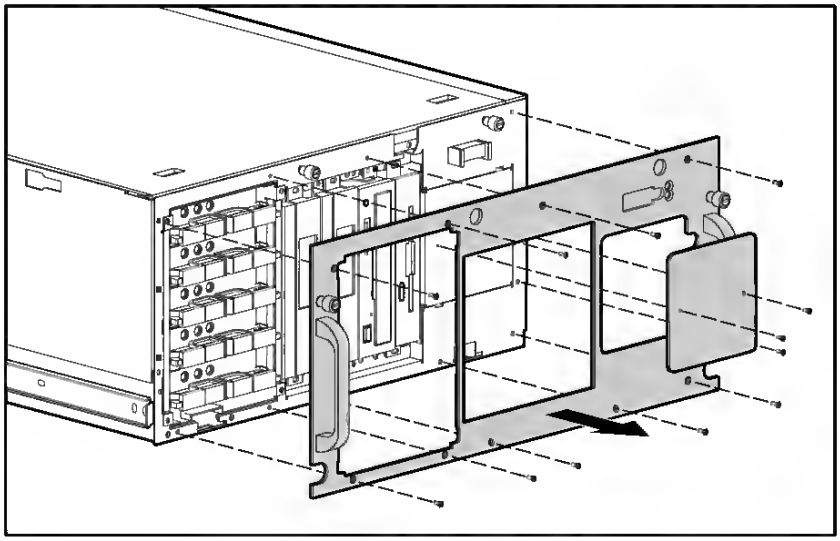

Figure 2-4. Removing Front Bezel

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3. Remove the screws from the front bezel panel and remove it.

Reverse steps 1 to 3 to replace the front bezel.

Large Access Panel

On the Compaq ProLiant 2500 Server, the large access panel is the side panel. On the Compaq ProLiant 2500R Server, the large access panel is the top panel.

Compaq ProLiant 2500

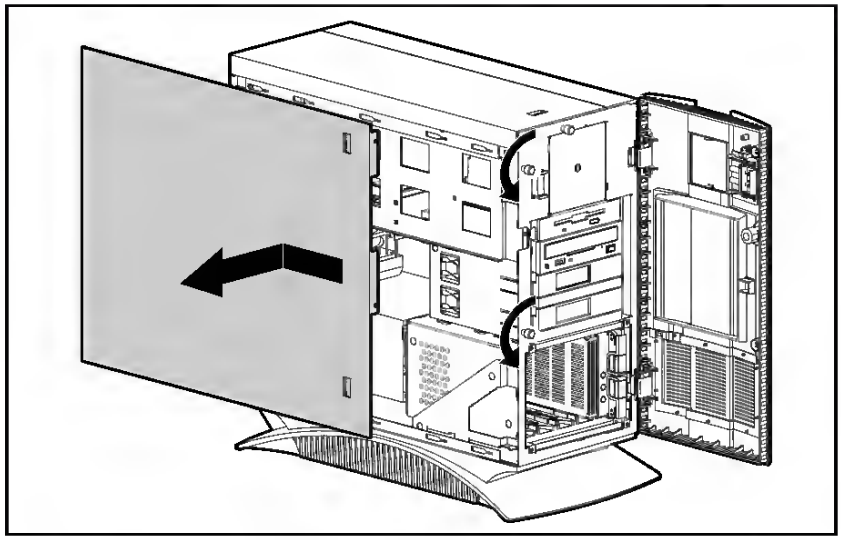

Figure 2-5. Removing the Large Access Panel from the Compaq ProLiant 2500

1. Unlock and open the front bezel door.
2. Loosen the thumb screws on the front panel.
3. Slide the large access panel toward the rear of the unit 0.5 inch (1.5 cm).
4. Lift and remove the large access panel.

CAUTION: Do not operate the server with the large access panel removed. The large access panel is an integral part of the cooling system and removing it while the system is running may adversely affect data integrity.

Reverse steps 1 to 4 to replace the large access panel.

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Compaq ProLiant 2500R

WARNING: High voltage present. Extreme care must be taken when running the Compaq ProLiant 2500R Server without the system unit cover on.

1. Unscrew the front panel thumb screws to release the server from the rack.
2. Using the handles, pull the server out from the rack to the locked position.

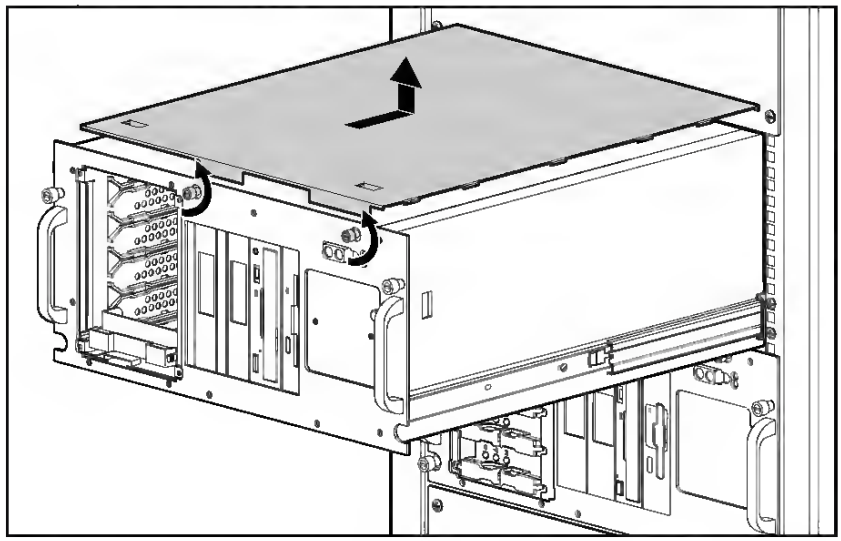

Figure 2-6. Removing the Large Access Panel from the Compaq ProLiant 2500R

3. Turn the two thumbscrews screws on the front bezel.
4. Slide the large access panel toward the rear of the unit 0.5 inch (1.5 cm).
5. Lift and remove the large access panel.

CAUTION: Do not operate the server with the large access panel removed. The large access panel is an integral part of the cooling system and removing it while the system is running may adversely affect data integrity.

Reverse steps 1 to 5 to replace the large access panel.

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Security Screws

If security screws are in place, you must remove them before you can remove the system I/O board tray assembly, the processor tray assembly, or the system I/O fan.

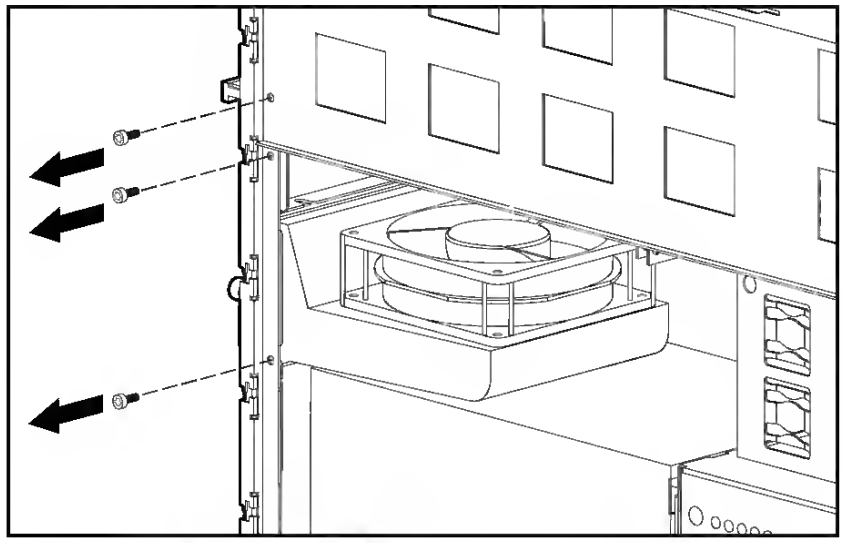

Figure 2-7. Removing Three Security Screws

1. If the computer is ON, turn it OFF and disconnect the power cord.
2. Disconnect any other external equipment connected to the computer.
3. Remove the large access panel.
4. Remove the security screws.

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Small Access Panel

On the Compaq ProLiant 2500, the small access panel is the top panel. On the Compaq ProLiant 2500R, it is the side panel.

Compaq ProLiant 2500

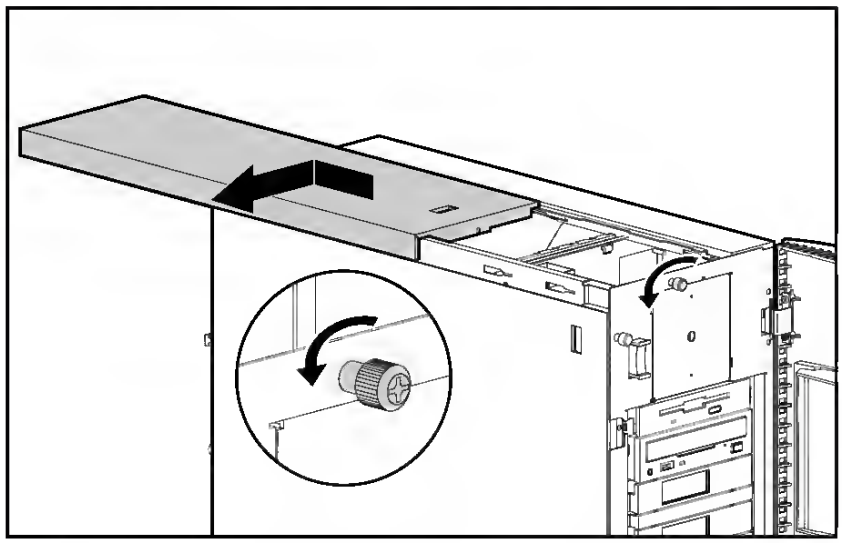

Figure 2-8. Removing the Small Access Panel from the Compaq ProLiant 2500

1. Open the front bezel door.
2. Loosen the side thumb screw on the front panel.
3. Slide the panel toward the rear of the unit about 0.5 inch (1.5 cm) and then slide the panel to the side of the server.
4. Lift and remove the small access panel.

CAUTION: Do not operate the server with the small access panel removed. The small access panel is an integral part of the cooling system and removing it while the system is running may adversely affect data integrity.

Reverse steps 1 to 4 to replace the small access panel.

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Compaq ProLiant 2500R

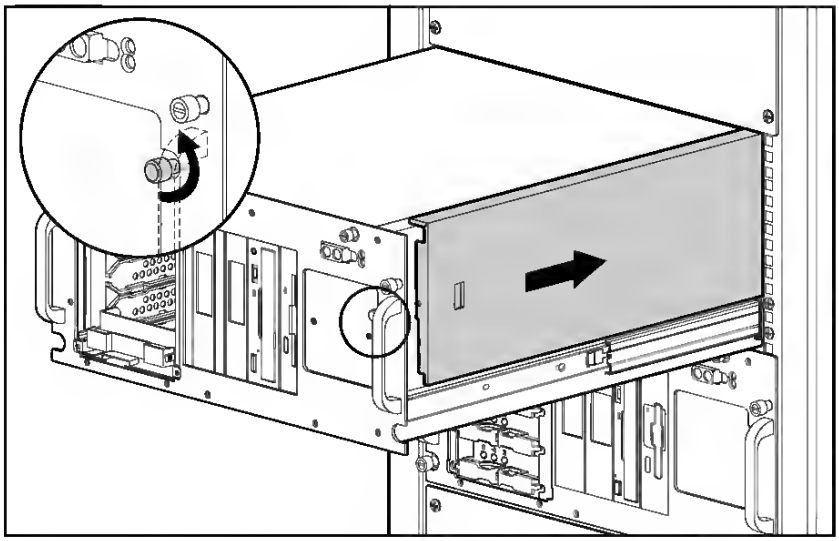

Figure 2-9. Removing the Small Access Panel from the Compaq ProLiant 2500R

1. Pull the server out from the rack to the locked position.
2. Loosen the top thumb screw on the front panel.
3. Slide the panel toward the rear of the unit about 0.5 inch (1.5 cm) and then slide the panel to the side of the server.
4. Lift and remove the small access panel.

CAUTION: Do not operate the server with the small access panel removed. The small access panel is an integral part of the cooling system and removing it while the system is running may adversely affect data integrity.

Reverse steps 1 to 4 to replace the small access panel.

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Mass Storage Devices

The Compaq ProLiant 2500 Server contains two areas for mass storage devices: the removable media area and the hot-pluggable or non-hot-pluggable hard drive cage.

Hot-pluggable models contain a maximum of seven, eight, or nine drive bays depending on the drive cage option: four in the removable media area, and three, four, or five in the hot-pluggable hard drive bays.

Non-hot-pluggable models of the Compaq ProLiant 2500 contain a maximum of eight non-hot-pluggable drive bays: four in the removable media area, and four in the non-hot-pluggable hard drive bays.

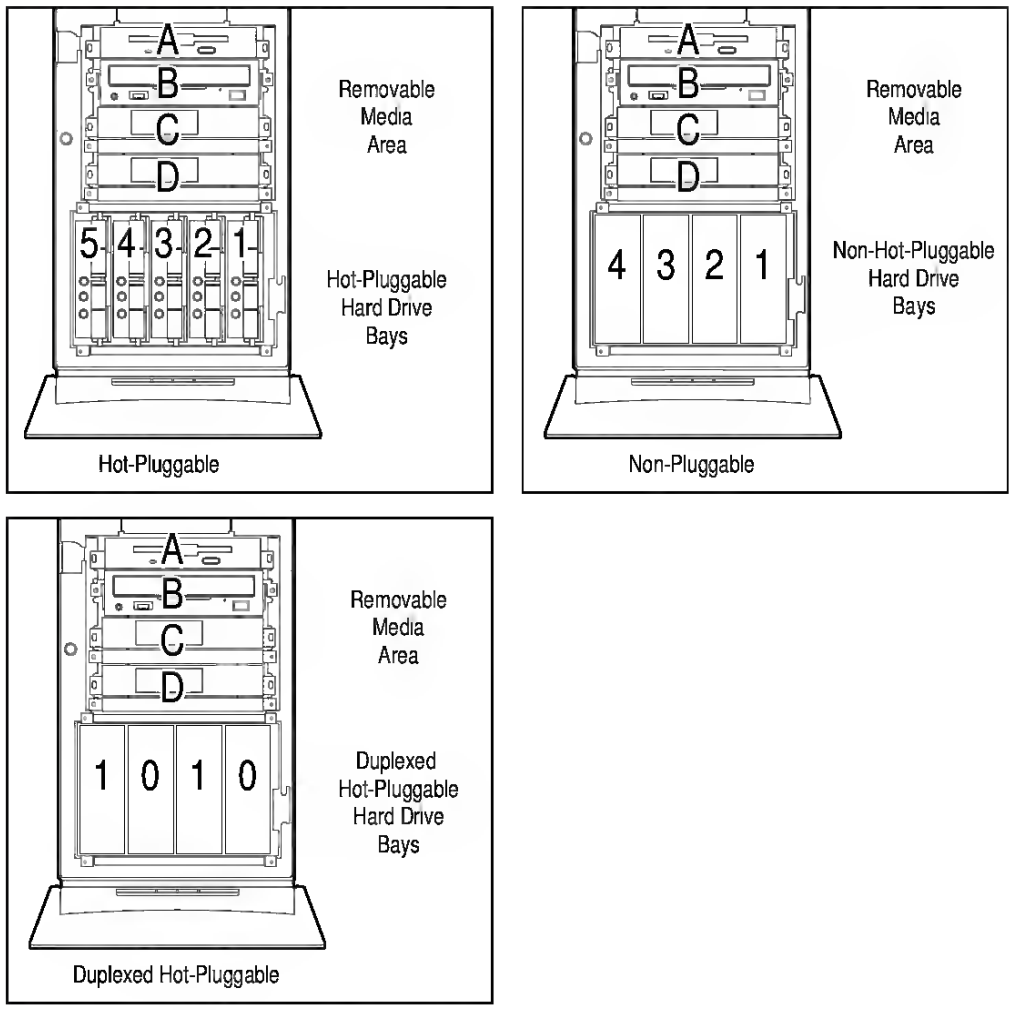

Figure 2-10. Mass Storage Device Locations and Bay Numbers

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Removable Media Storage Devices

Table 2-1 shows the supported mass storage devices and their supported locations.

Table 2-1
Removable Media Bay Configurations

	Storage Bays							
	Non-Hot-Pluggable or Duplexed Models				Hot-Pluggable Models			
Mass Storage Device	**4**	**5**	**6**	**7**	**5**	**6**	**7**	**8**
1.44-MB, 3.5" Diskette Drive				✓				✓
1.2-MB, 5.25" Diskette Drive				✓				✓
2/8-GB DAT (Digital Audio Tape) Drive	✓	✓			✓	✓		
525-MB ACA Tape Drive	✓	✓			✓	✓		
CD-ROM Drive			✓				✓	
4/16-GB TurboDAT Drive	✓	✓			✓	✓		
1.2-GB Tape Drive	✓	✓			✓	✓		
4/16-GB DAT Autoloader (Requires bays 4 and 5 or 5 and 6)	✓	✓			✓	✓		
10/20-GB DLT Drive	✓	✓			✓	✓		
15/30-GB DLT Drive	✓	✓			✓	✓		

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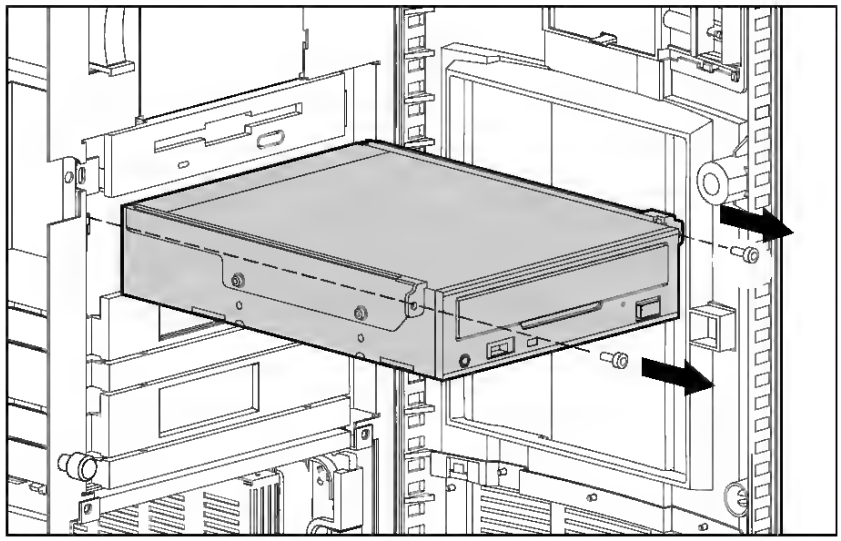

Figure 2-11. Removing a Storage Device from the Removable Media Area

1. Remove the large access panel.
2. Disconnect the power and signal cables from the rear of the storage device.
3. Tower units - open the front bezel door
   Rack units - remove the front bezel panel, see page 2-5
4. Remove the retaining screws.
5. Slide the mass storage device out.

Reverse steps 1 to 4 to replace a mass storage device.

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Hot-Pluggable Hard Drives

Hot-pluggable hard drives used in combination with the integrated Wide-Ultra SCSI Controller can be replaced while the power is on.

NOTE: It is not necessary to set the SCSI ID jumpers on a Compaq replacement hot-pluggable hard drive. The SCSI ID is set automatically by the backplane board and the hot-pluggable tray (to a SCSI ID matching the bay number) when the drive is installed.

CAUTION: Before removing any hot-pluggable hard drive, read the guidelines listed in the following section.

Important Guidelines For Replacing Hot-Pluggable Hard Drives

When you replace a drive configured for fault tolerance, the replacement drive will automatically begin to be restored. When a drive is being restored, the *Online* LED will flash green. The LED will continue to flash until the drive is completely restored.

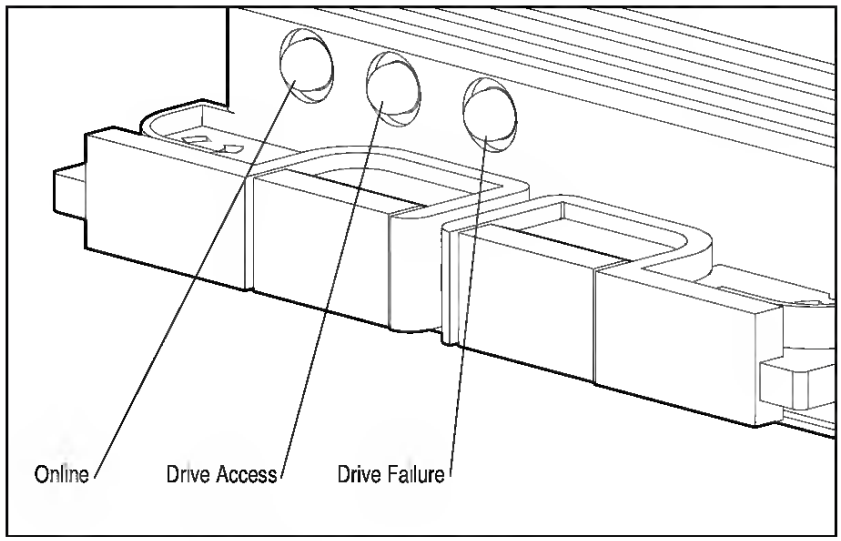

Figure 2-12. Hot-Pluggable Hard Drive LED Indicators

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When replacing hot-pluggable hard drives, you must follow these guidelines:

- **Never remove more than one drive at a time.** When a drive is replaced, the controller uses data from the other drives in the array to reconstruct data on the replacement drive. If more than one drive is removed, a complete data set is not available to reconstruct data on the replacement drive(s).
- **Never remove a working drive when another drive has failed.** Drives that have been failed by the controller are indicated by the amber *Drive Failure* LED on the drive tray. Permanent data loss will occur if you remove a working drive when replacing a failed drive.
- **Never remove a drive while another drive is being rebuilt.** A drives' *Online* LED flashes green when it is being rebuilt. A replaced drive is restored from data stored on the other drives.
- **Never turn a ProLiant Storage System OFF while the server controlling it is powered ON.** Doing so will cause the server's array controller to mark the drives as "failed." This could result in permanent data loss.
- **If an online spare drive is installed, wait for it to complete rebuilding before replacing the failed drive.** When a drive fails, the online spare will become active and begin to be rebuilt as a replacement drive. After the online spare has been completely rebuilt (*Online* LED will be on solid), replace the failed drive with a new drive. **Do not** replace the failed drive with the online spare.
- **A POST error message (1786) will occur when the system is turned on if a drive(s) has been replaced while the system is OFF.** When this occurs you will be prompted to:

  PRESS F1 TO BOOT THE SYSTEM AND REBUILD THE REPLACED DRIVE, OR

  PRESS F2 TO BOOT THE SYSTEM AND NOT REBUILD THE DRIVE(S).

CAUTION: Pressing F2 will cause permanent data loss to the entire logical drive. Press F2 only if all of the drives have been replaced or if complete data loss is desired.

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Replacing Hot-Pluggable Hard Drives

The front access drive bay area is behind the front bezel door and can hold up to four or five third-height hot-pluggable hard drives, depending on the optional drive cage.

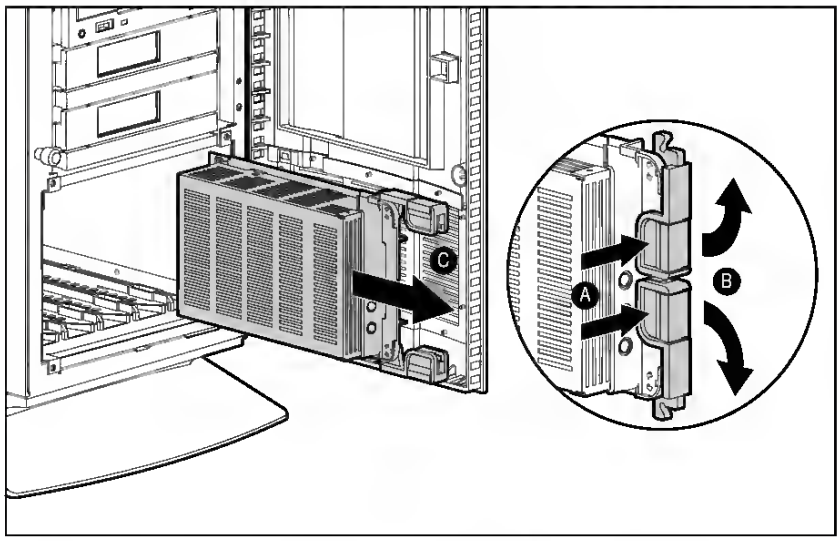

Figure 2-13. Removing a Hot-Pluggable Hard Drive

1. Press the releases on the ejector levers [A] and swing levers out [B] as shown. This will pull the drive out of the backplane connector.
2. Slide the hot-pluggable hard drive out [C].

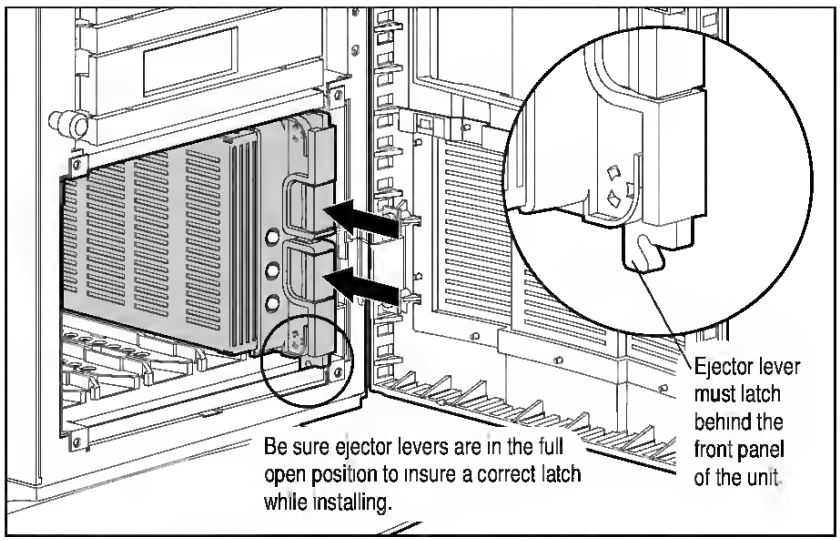
Ejector lever must latch behind the front panel of the unit.
Be sure ejector levers are in the full open position to insure a correct latch while installing.

Figure 2-14. Replacing a Hot-Pluggable Hard Drive

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To Install a Drive

1. Slide the hot-pluggable hard drive all the way into the drive cage.
2. Swing the ejector levers in to seat the drive tray into the backplane connector.

Replacing Non-Hot-Pluggable Hard Drives

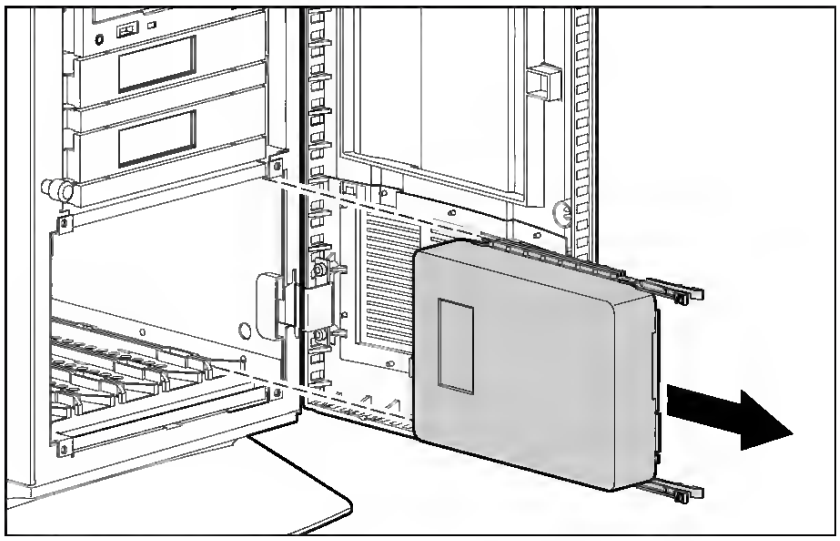

Figure 2-15. Removing a Non-Hot-Pluggable Hard Drive

1. Remove the large access panel.
2. Disconnect the power and signal cables from the rear of the hard drive.
3. Squeeze the two release tabs on each side of the drive and slide the drive out.

Reverse steps 1 to 3 to replace a non-hot-pluggable hard drive.

IMPORTANT: Ensure that the SCSI ID setting on the replaced non-hot-pluggable drive matches the SCSI ID setting on the removed drive.

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Cable Folding and Routing Diagrams

CAUTION: When routing cables, always make sure that the cables are not in a position where they will be pinched or crimped.

IMPORTANT: All SCSI hard drives on the same SCSI bus must be internal (within the server) or in an external storage system, but not both. A configuration with both internal and external SCSI hard drives requires more than one single-channel SCSI controller. A multi-channel controller, such as the Compaq SMART-2 Array Controller, supports both internal and external SCSI hard drives on separate SCSI buses.

IMPORTANT: All integrated 32-Bit SCSI-2 Controllers must be terminated by connecting one of the following to the Wide-Ultra SCSI connector on the system board:

- Terminated SCSI cable
- SCSI cable that is also attached to a hot-pluggable backplane
- SCSI cable that is also attached to an internal SCSI ribbon cable for non-hot-pluggable SCSI drives

Cable Diagram for Diskette Drive

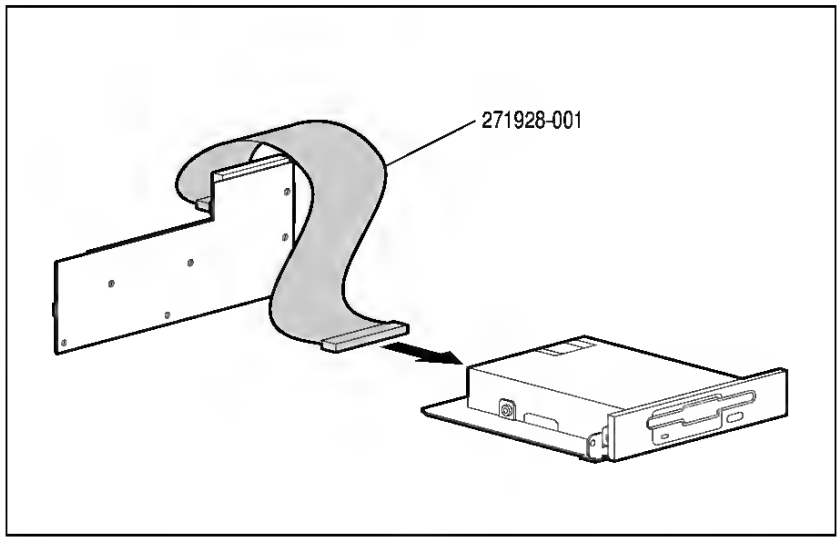

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Figure 2-16. Diskette Drive Cable (Spares Part No. 271928-001)

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Cable Diagram for IDE/CD-ROM

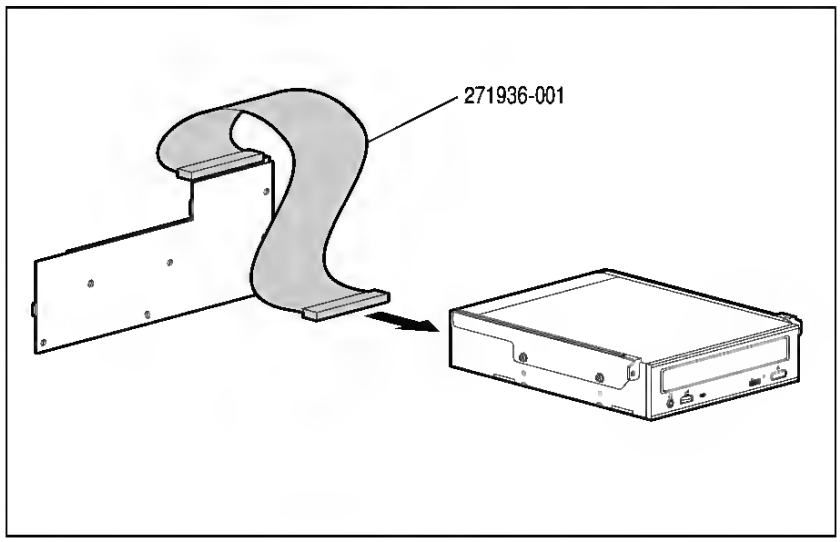

Figure 2-17. IDE/CD-ROM Cable (Spares Part No. 271936-001)

Cable Diagram for Hot-Pluggable Drive Cages

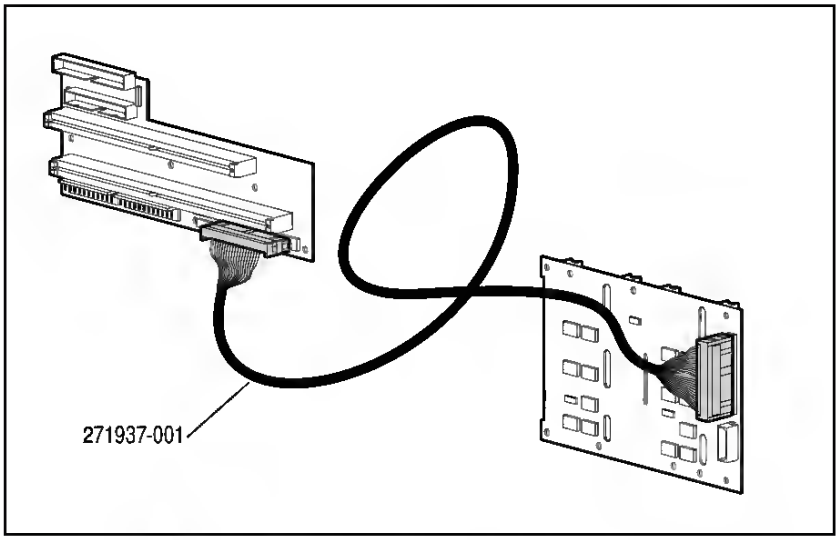

Figure 2-18. Wide SCSI Cables (Hot-pluggable) (Spares Part No. 271937-001)

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Cable Diagram for Non-Hot-Pluggable Drive Cages

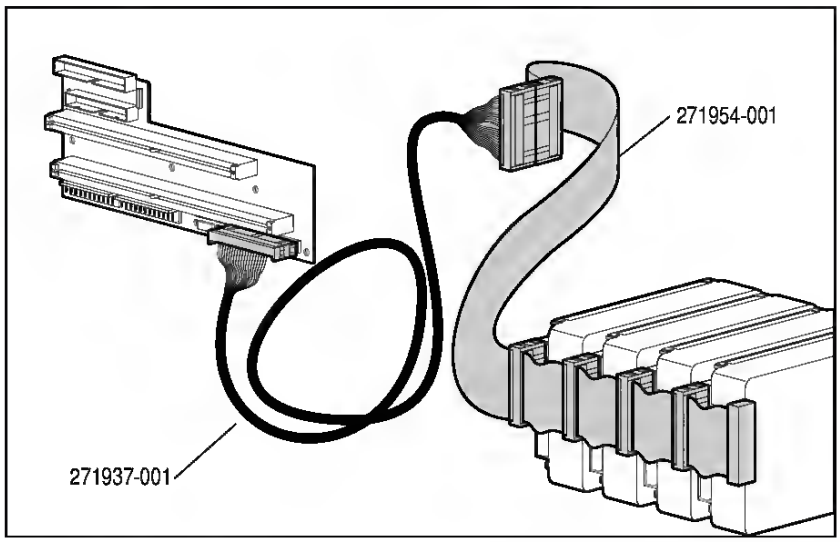

Figure 2-19. SCSI Cable (Non-Hot-Pluggable) (Spares Part No. 271954-001)

Cable Diagram for Duplexed Hot-Pluggable Hard Drives

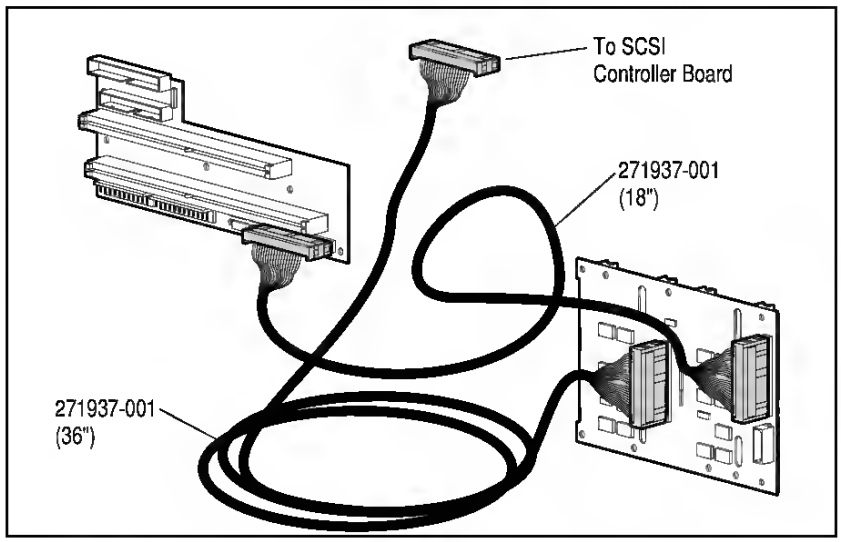

Figure 2-20. Cables for Duplexed Hot-Pluggable Hard Drives (Spares Part No. 271937-001)

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Processor Tray Assembly

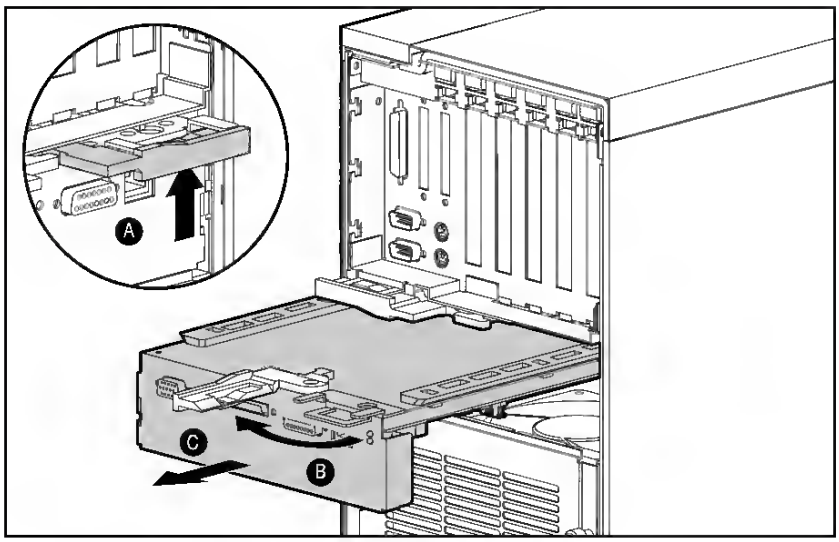

Figure 2-21. Removing the Processor Tray Assembly

1. If installed, remove the security screw.
2. Lift the catch on the release lever [A] and swing the lever out [B] to unlock the processor tray assembly.
3. Pull out the tray [C].

Reverse steps 1 to 3 to replace the processor tray assembly.

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Boards

This section describes how to remove and replace the hot-pluggable hard drive backplane board, the processor backplane board, memory modules, the system I/O board tray assembly, processor power module, processor chip, processor board, and expansion boards.

Drive Cage with Hot-Pluggable Drive Backplane Board

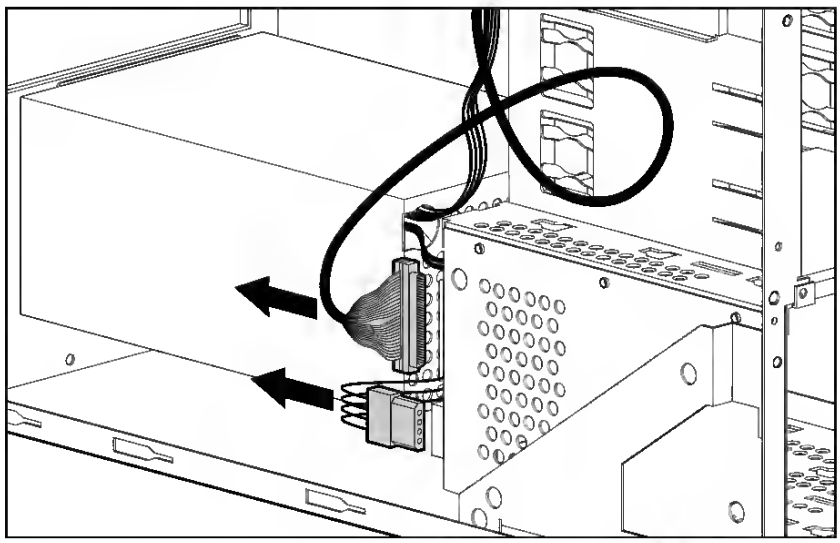

Figure 2-22. Removing the Cables from the Hot-Pluggable Drive Backplane Board

1. Remove the large access panel.
2. Disconnect the signal and power cables from the backplane board.

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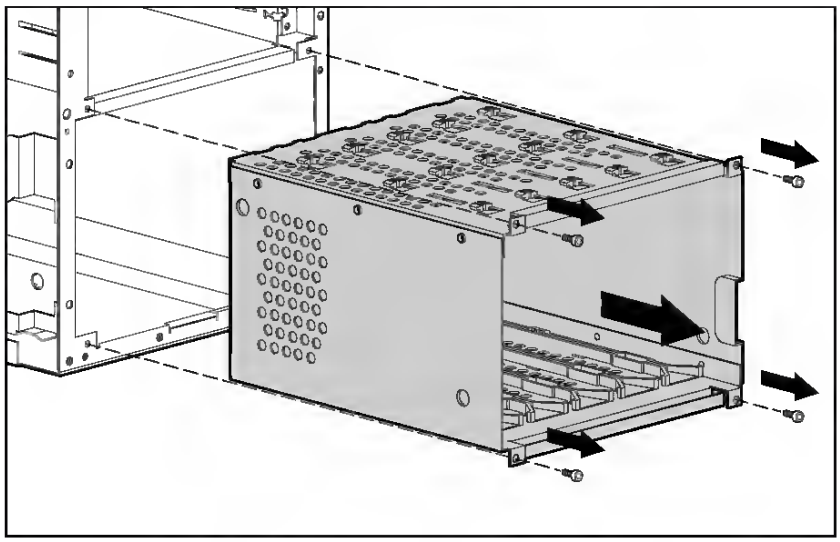

Figure 2-23. Removing the Drive Cage

3. Label and remove all hard drives from the drive cage.

> **CAUTION:** Be sure to label the drives before removing them so that they can be replaced in their original positions. Failure to do so will result in permanent data loss.

4. Remove the four retaining screws from the drive cage.
5. Pull out the drive cage with backplane board.

Reverse steps 1 to 5 to replace the drive cage and backplane board.

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System I/O and Processor Backplane Board

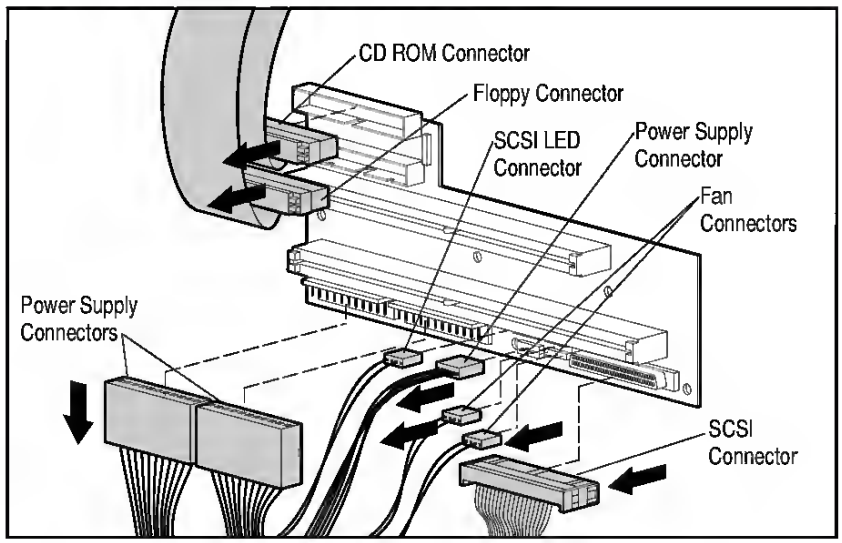

Figure 2-24. Removing the System I/O and Processor Backplane Board

1. Remove the large access panel.
2. Remove the processor tray assembly.
3. Remove the system I/O board tray assembly (refer to "System I/O Board Tray Assembly" later in this document).
4. Disconnect the signal and power cables for the processor backplane board.

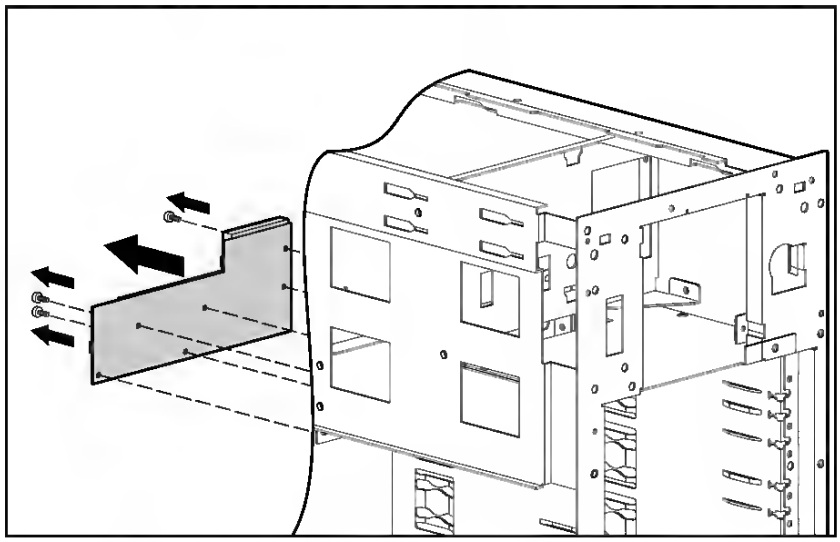

Figure 2-25. Removing the System I/O and Processor Backplane Board

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5. Remove the retaining screws.
6. Slide the processor backplane board over, and lift it off.

Reverse steps 1 to 6 to replace the system I/O and processor backplane board.

Memory

The Compaq ProLiant 2500 and 2500R Servers come standard with 32 megabytes of memory. Memory can be expanded to a maximum of 1.024 gigabytes by installing 60-ns or faster EDO- or FASTPAGE-buffered, 32-, 64-, 128-, or 256-MB, 4-K refreshed Dual Inline Memory Modules (DIMMs) on the Pentium Pro processor board.

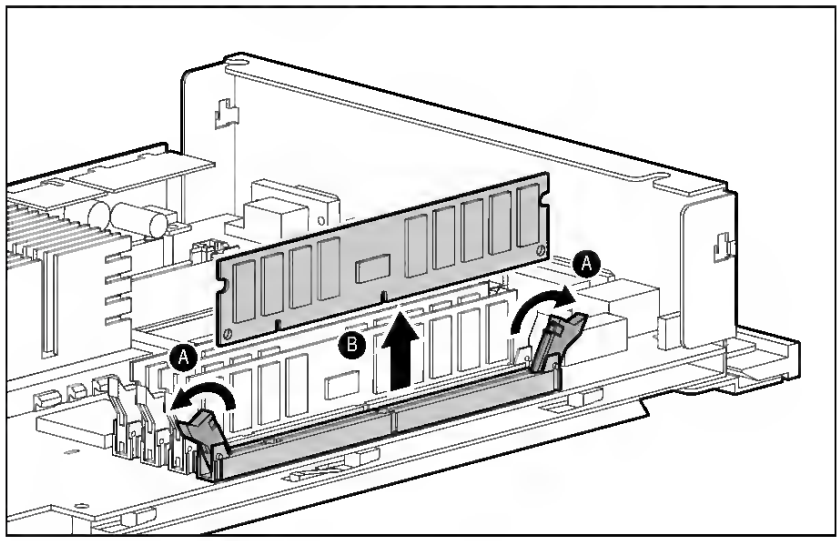

Figure 2-26. Removing the DIMM Module

1. If installed, remove the security screw for the processor tray assembly.
2. Slide out the processor tray assembly from the rear of the unit.
3. Turn the assembly over.
4. Press both DIMM connector latches outward [A].
5. Lift the DIMM module out [B]

Reverse steps 1 to 5 to replace the DIMM module.

IMPORTANT: A memory module can be installed one way only. Be sure to match the two *key slots* on the module with the tab on the memory socket. Push the module down into the socket, ensuring that the module is fully inserted and properly seated.

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The following guidelines **MUST** be followed when installing or replacing memory:

- Use only 32-, 64-, 128-, or 256-megabyte; EDO- or FASTPAGE-buffered; 4-K refreshed DIMMs.
- DIMMs must be 60-ns or faster.

CAUTION: Use only Fast-Page/EDO Mode 72-Bit Wide JEDEC standard DIMMs using 3.3 volts and ECC capability. Use EDO-buffered DIMMs. Non-compatible DIMMs may adversely affect data integrity.

NOTE: The specific DIMM bit pattern required to support error checking and correcting (ECC) memory is based on the parity scheme; one byte data, one bit parity. The data byte and parity are constructed of DRAMs that are "n" locations deep by 4-bits wide or 1-bit wide and "n" can be any number. (That is, "n" locations deep x 4-bits wide or "n" locations deep x 1-bit wide.) Use only Compaq DIMMs or JEDEC-compliant DIMMs that conform to this parity scheme.

The following table shows typical memory configurations for Compaq ProLiant 2500 and 2500R Servers with the Pentium Pro processor.

Table 2-2
Examples of DIMM Upgrade Combinations

Total Memory	Slot 1	Slot 2	Slot 3	Slot 4
32 MB	32 MB			
64 MB	32 MB	32 MB		
64 MB	64 MB			
96 MB	64 MB	32 MB		
96 MB	32 MB	32 MB	32 MB	
256 MB	128 MB	128 MB		
256 MB	64 MB	64 MB	64 MB	64 MB
512 MB	128 MB	128 MB	128 MB	128 MB
512 MB	256 MB	256 MB		
768 MB	256 MB	256 MB	128 MB	128 MB
1.024 GB	256 MB	256 MB	256 MB	256 MB

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System I/O Board Tray Assembly

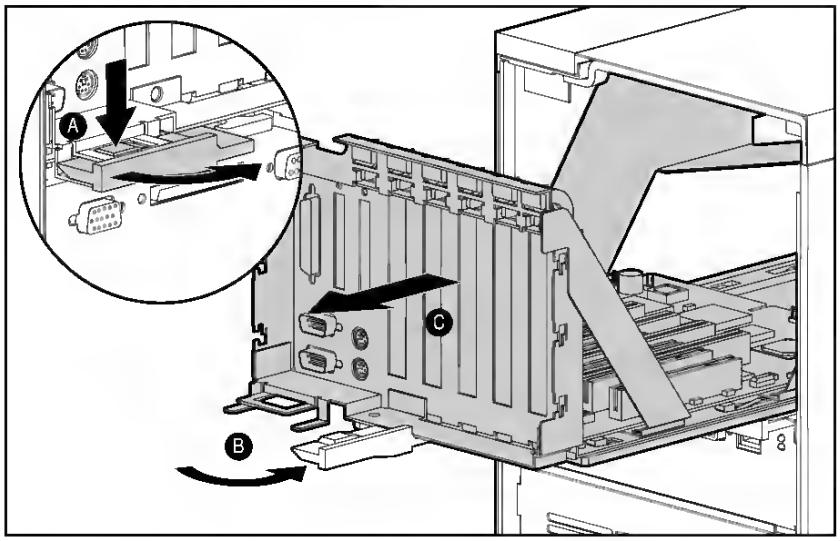

Figure 2-27. Removing the System I/O Board Tray Assembly

1. Remove the small access panel.
2. If installed, remove the security screw.
3. Disconnect all cables from expansion boards.
4. Press down the catch on the release lever [A] and swing the lever out [B] to unlock the system I/O board tray assembly.
5. Pull out the tray [C].
6. Remove all expansion boards from the assembly.

Reverse steps 1 to 6 to replace the system I/O board tray assembly.

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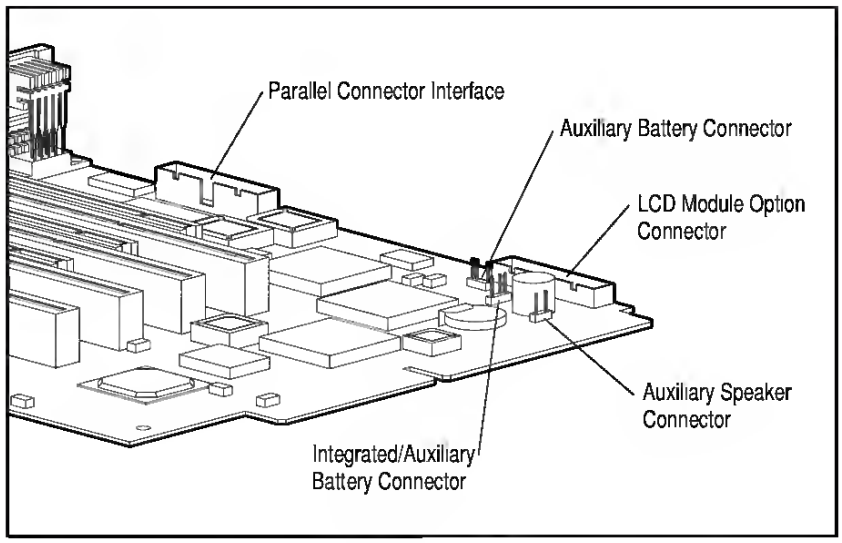

Figure 2-28. System I/O Board Connectors

Processor Power Module

The processor power modules are located on the processor board.

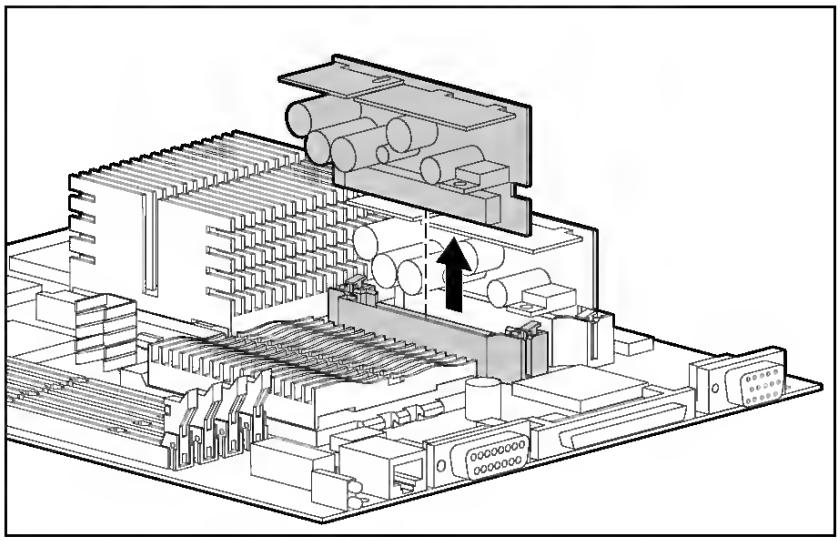

Figure 2-29. Removing the Processor Power Module

1. If installed, remove the security screw for the processor tray assembly.
2. Slide out the processor tray assembly from the rear of the unit.

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3. Turn over the tray assembly.
4. Lift out the module.

Reverse steps 1 to 4 to replace the processor power module.

Processor Chip

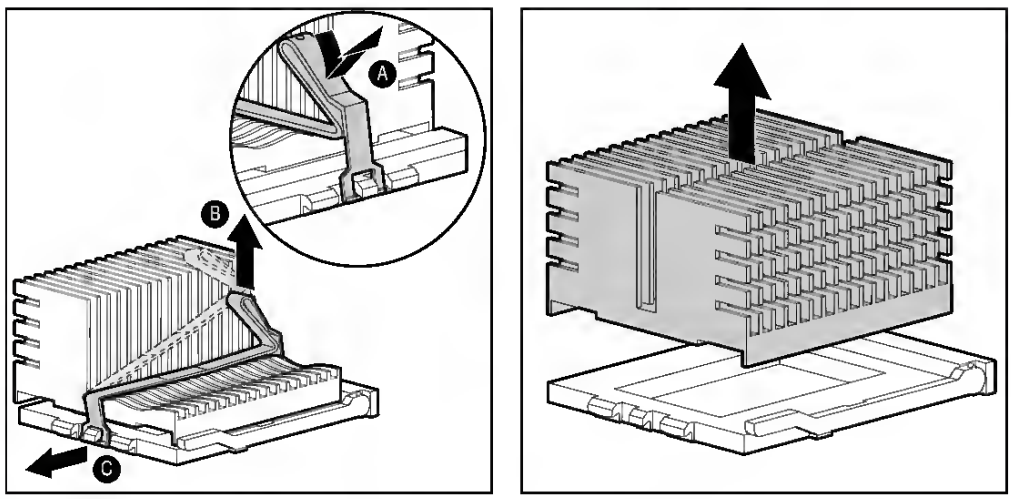

Figure 2-30. Removing the Heat Sink

1. If installed, remove the security screw for the processor tray assembly.
2. Slide out the processor tray assembly from the rear of the unit.
3. Turn over the tray assembly.
4. Press down and lift up [A] on the heat sink retaining clip. Pull it up [B] and off [C].
5. Remove the heat sink and thermal pad.

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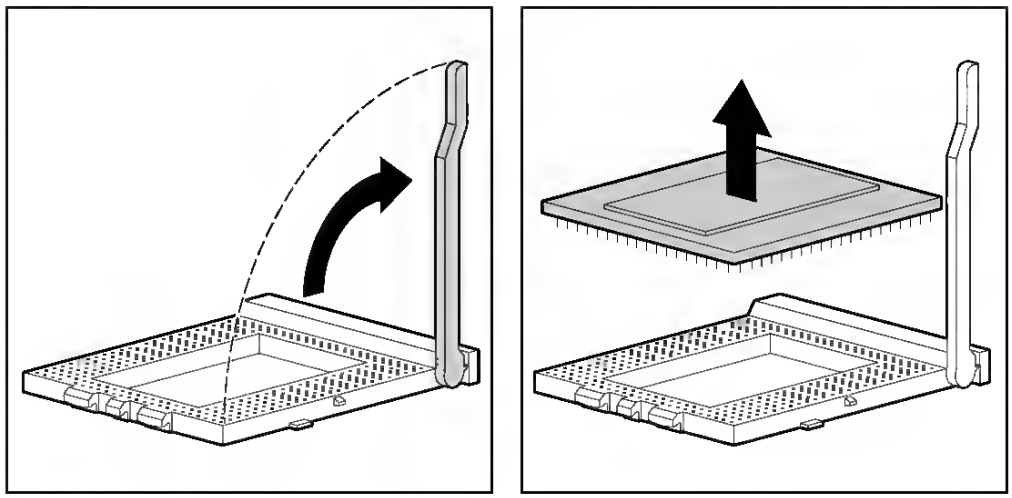

Figure 2-31. Removing a Processor Chip

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6. Unlatch the lever and lift.
7. Remove processor chip.

Reverse steps 1 to 7 to replace the processor chip.

> **CAUTION:** Align the pin pattern on the processor to that of the processor socket.

Processor Board

The processor board can be replaced only by replacing the processor tray assembly.

1. If installed, remove the security screw for the processor tray assembly.
2. Slide out the processor tray assembly from the rear of the unit.
3. Remove memory modules and install them on the new processor tray assembly.
4. Remove the processor power module and install it on the new processor tray assembly.
5. Remove the processor chip and install it on the new processor tray assembly.
6. Slide in the new processor tray assembly.

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Expansion Boards

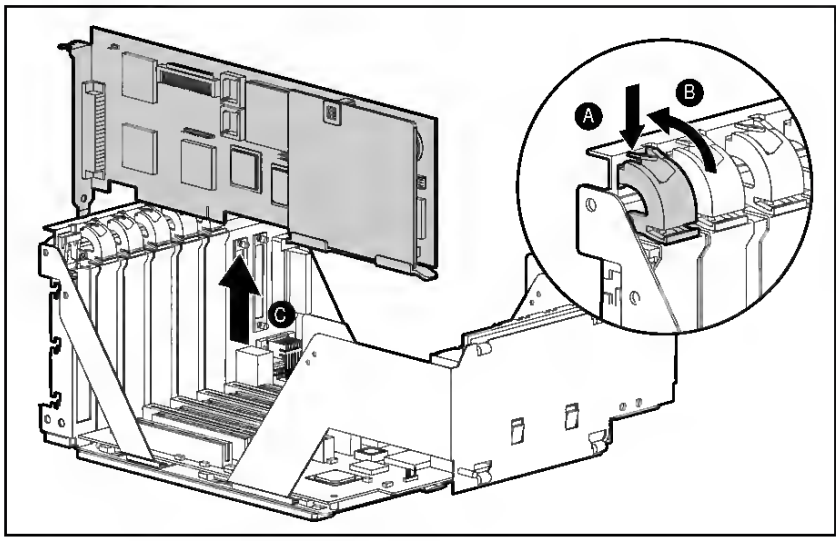

Figure 2-32. Removing the Expansion Board

1. Remove the small access panel.
2. Press on the top of the expansion slot latch [A] and open the latch toward the rear of the expansion slot cage [B].
3. Pull out expansion board [C].

Reverse steps 1 to 3 to replace the expansion board.

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Power Supply

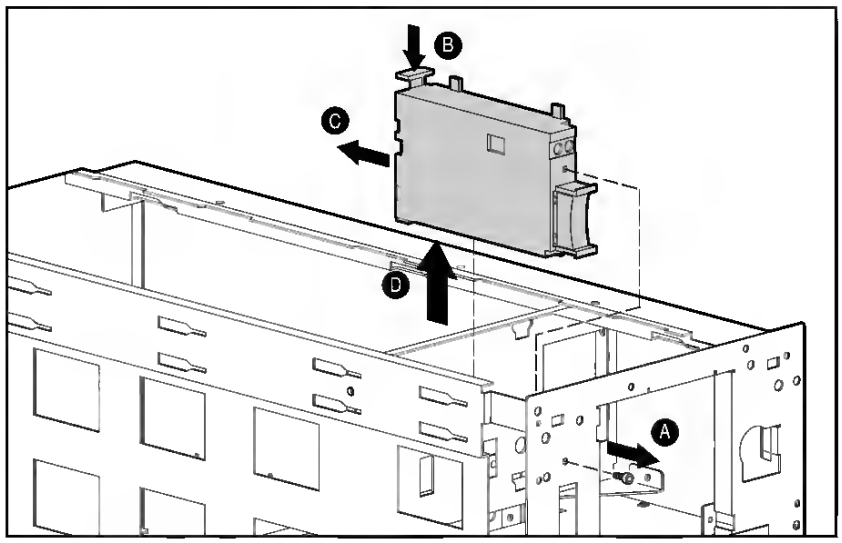

Figure 2-33. Removing the Power Switch

1. Remove the large access panel.
2. Disconnect all power connectors from boards and/or peripheral devices.
3. Remove the retaining screw from the power switch bracket [A].
4. Press the release tab on the power switch bracket [B] and slide the bracket back [C] and up [D].
5. Remove power switch and cable from bracket (refer to Figure 2-35).

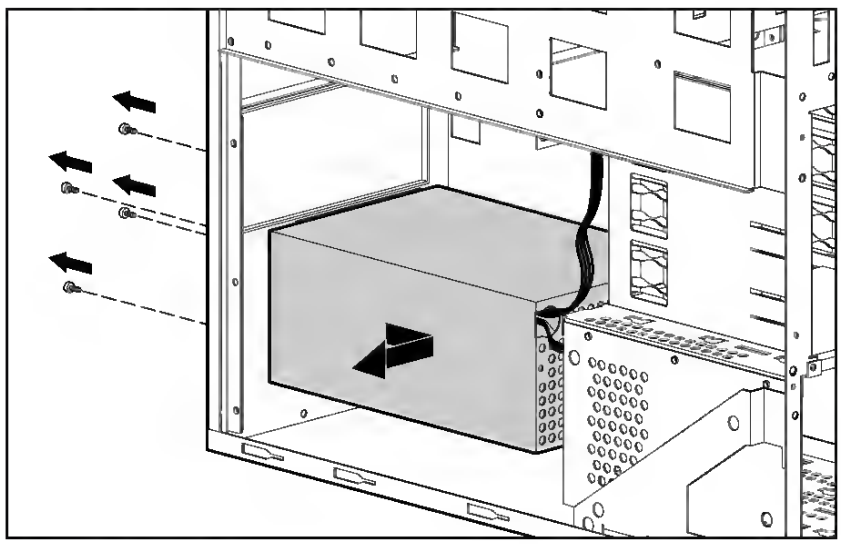

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Figure 2-34. Removing the Power Supply

6. Remove the four screws at the rear of power supply.
7. Lift power supply out, pulling switch and cable through chassis.

Reverse steps 1 to 7 to replace the power supply.

IMPORTANT: When replacing the power supply, make sure that the power switch cable is properly threaded through the bracket's strain relief as shown in Figure 2-35.

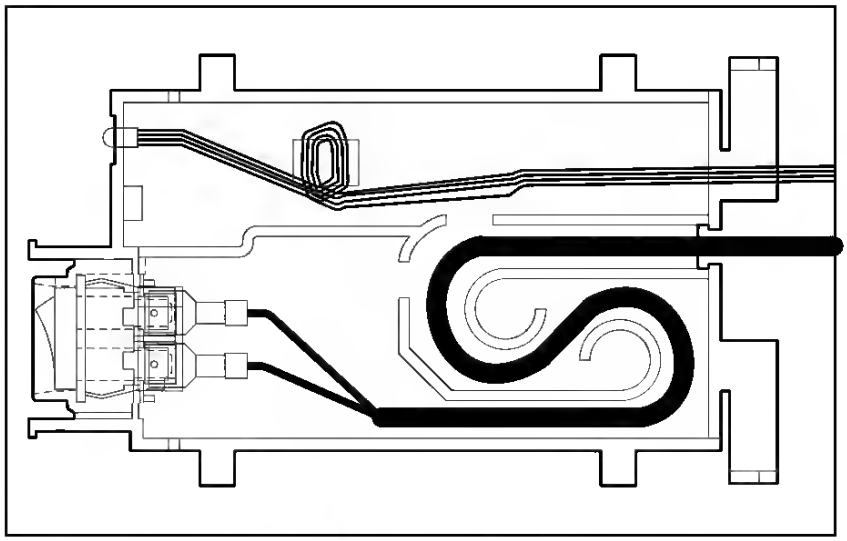

Figure 2-35. Power Supply Switch Cable Strain Relief Bracket

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Miscellaneous Parts

System I/O Fan

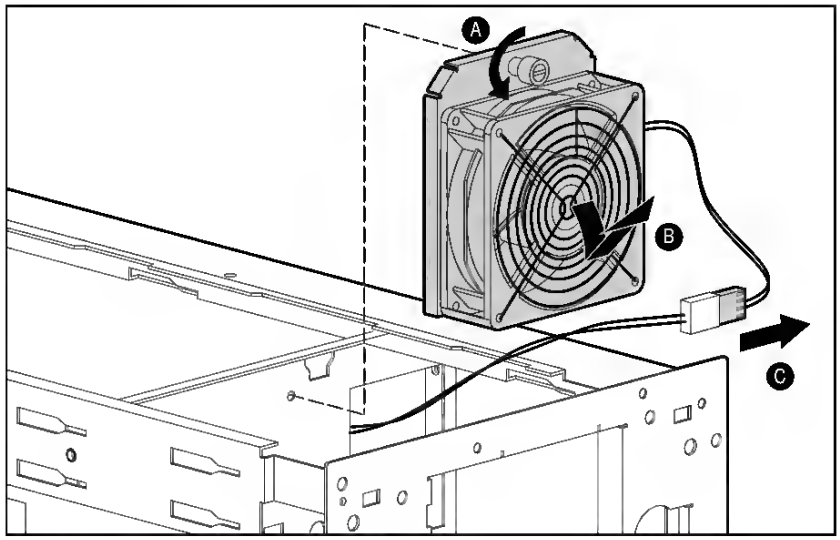

Figure 2-36. Removing the System I/O Fan

1. Remove the small access panel.
2. Turn the thumbscrew [A] to loosen the system I/O fan.
3. Tilt the system I/O fan [B] and pull it out.
4. Disconnect the fan cable [C].

Reverse steps 1 to 4 to replace the system I/O fan.

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Processor Fan

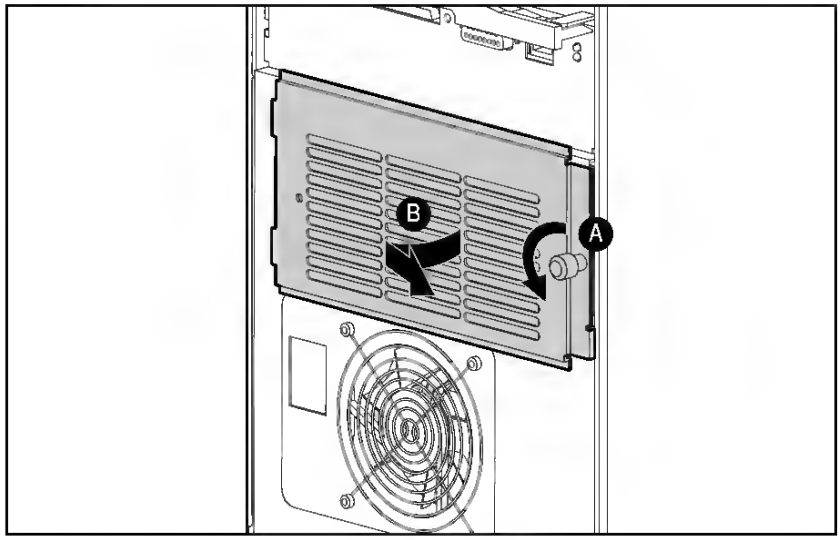

Figure 2-37. Opening the Processor Fan Door

1. Turn the thumb screw on the processor fan door [A].
2. Open the processor fan door and pull out the processor fan [B].

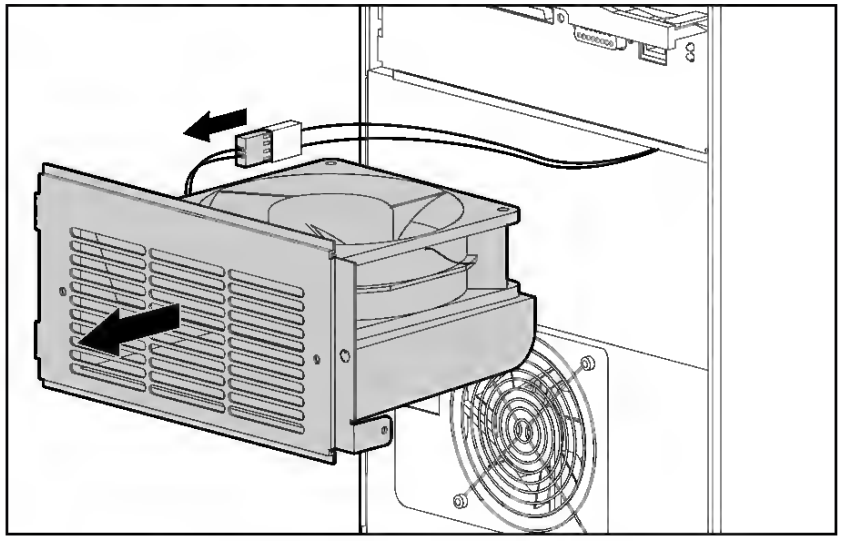

Figure 2-38. Removing the Processor Fan

3. Disconnect the fan cable.

Reverse steps 1 to 3 to replace the processor fan.

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Battery

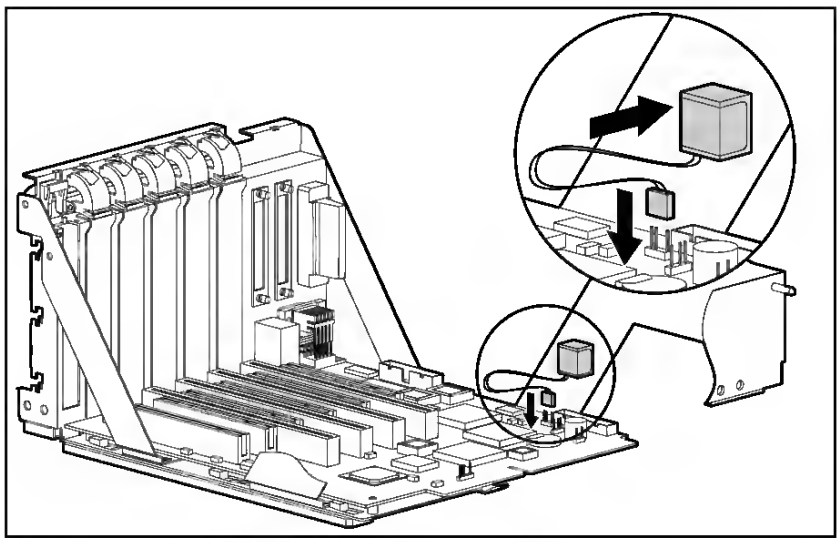

Figure 2-39. Battery Module

1. Remove the small access panel.
2. Remove expansion boards if necessary.
3. Connect the battery cable to the battery header on the system I/O board.
4. Move the jumper on connector E2 from pins 1 and 2 to pins 2 and 3.
5. Attach the battery to the tray assembly using the self-stick adhesive.
6. Run Compaq System Configuration Utility.

CAUTION: Do not remove the lithium battery from the system I/O board. Permanent damage may occur to the system I/O board if removed. If the battery fails, use the battery module replacement.

WARNING: The battery/clock module contains a lithium battery that may explode if mishandled. Do not abuse, recharge, disassemble, or dispose of in fire or heat above 90° C, incinerate, or expose to water or fire. Use only replacement battery/clock modules supplied by Compaq Computer Corporation.

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Chapter 3
Diagnostic Tools

This chapter describes software and firmware diagnostic tools available for the Compaq Server products. These include:

- Power-On Self-Test (POST)
- Diagnostics (DIAGS)
- Drive Array Advanced Diagnostics (DAAD)
- Automatic Server Recovery
- ROMPaq utilities to upgrade flash ROMs

Utility Access

The Compaq SmartStart and Support Software CD contains the SmartStart program and many of the Compaq utilities needed to maintain your system, including:

- System Configuration Utility
- Array Configuration Utility
- Drive Array Advanced Diagnostics Utility
- ROMPaq Firmware Upgrade Utilities

CAUTION: Do not select the Erase Utility when running the SmartStart and Support Software CD. This will result in data loss to the entire system.

There are several ways to access these utilities:

- **Run the Utilities on the System Partition.**

  If the system was installed using the SmartStart utility, the Compaq utilities will automatically be available on the system partition. The system partition could also have been created during a manual system installation.

  To run the utilities on the system partition, boot the system and press **F10** when the cursor moves to the upper right corner of the screen. (If the cursor does not move to the upper right corner of the screen, the system partition does not exist.) Then select the utilities from the menu.

  - The System Configuration Utility is available under System Configuration menu.
  - The Array Configuration Utility is available under the System Configuration menu.

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- The Drive Array Advanced Diagnostics Utility is available under the Diagnostics and Utilities menu.
- The ROMPaq Firmware Upgrade Utility is available under the Diagnostics and Utilities menu.

■ **Run the Utilities from diskette.**

You can also run the utilities from their individual diskettes. If you have a utility diskette newer than the version on the SmartStart and Support Software CD, use that diskette.

You can also create a diskette version of the utility from the SmartStart and Support Software CD. To create diskette versions of the utilities from the CD:

1. Boot the computer from the Compaq SmartStart and Support Software CD.
2. From the Compaq System Utilities screen, select *Create Support Software* and press the Next button.
3. Select the diskette you would like to create from the list and follow the instructions on the screen.

■ **Run the Utilities from the Compaq SmartStart and Support Software CD.**

You can run some utilities directly from the Compaq SmartStart and Support Software CD. To run these utilities:

1. Boot the Compaq SmartStart and Support Software CD.
2. From the Compaq System Utilities screen, select the utility you wish to run and press the Next button.
   - To execute the System Configuration Utility, select *Run System Configuration Utility*.
   - To execute the Array Configuration Utility, select *Run Array Configuration Utility*.

IMPORTANT: Only the System Configuration Utility and the Array Configuration Utility can be executed from the Compaq SmartStart and Support Software CD. All other utilities can be executed only from the system partition or from diskette.

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Power-On Self-Test (POST)

POST is a series of diagnostic tests that run automatically on Compaq computers when the system is turned on. POST checks the following assemblies to ensure that the computer system is functioning properly:

- Keyboard
- Power supply
- System board
- Memory
- Memory expansion boards
- Controllers
- Diskette drives
- Hard drives

If POST finds an error in the system, an error condition is indicated by an audible and/or visual message. If an error code is displayed on the screen during POST or after resetting the system, follow the instructions in Table 3-1. The error messages and codes listed in Table 3-1 include all codes generated by Compaq products.
Your system will generate only those codes that are applicable to your configuration and options.

Table 3-1
POST Error Messages

Error Code	Beeps	Probable Source of Problem	Action
A Critical Error occurred prior to this power-up	None	A catastrophic system error, which caused the server to crash, has been logged.	Run Diagnostics. Replace failed assembly as indicated.
101-ROM Error	1L,1S	System ROM checksum.	Run Diagnostics. Replace failed assembly as indicated or contact your service provider.
101-I/O ROM Error	None	Options ROM checksum.	Run Diagnostics. Replace failed assembly as indicated or contact your service provider.

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102-System Board Failure	None	DMA, timers, etc.	Replace the system board. Run the Compaq System Configuration Utility.
104-ASR Timer Failure	None	System board failure.	Run Diagnostics.
162-System Options Not Set	2S	Configuration incorrect.	Run the System Configuration Utility and correct.

Continued

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POST Error Messages *Continued*

Error Code	Beeps	Probable Source of Problem	Action
163-Time & Date Not Set	2S	Invalid time or date in configuration memory.	Run the System Configuration Utility and correct.
164-Memory Size Error	2S	Configuration memory incorrect.	Run the System Configuration Utility and correct.
170- Expansion Device Not Responding	None	EISA or PCI Expansion board failure.	Check board for secure installation. Replace the failed board if necessary.
172- Configuration Nonvolatile Memory Invalid	None	Nonvolatile configuration corrupt or jumper installed.	Run the System Configuration Utility and correct.
172-1 Configuration Nonvolatile Memory Invalid	None	Nonvolatile configuration corrupt.	Run the System Configuration Utility and correct.
172-2 IRC Configuration Invalid	None	IRC configuration not set up properly. - COM Port invalid - PCI COM Port - Incorrect IRQ	Run the System Configuration Utility and correct.
173- Slot ID Mismatch	None	Board replaced, but configuration not updated.	Run the System Configuration Utility and correct.
174- Configuration/Slot Mismatch Device Not Found	None	EISA or PCI board not found.	Run the System Configuration Utility and correct.
175- Configuration/Slot Mismatch Device Found	None	EISA or PCI board added, configuration not updated.	Run the System Configuration Utility and correct.
176-Slot with Not Readable ID Yields Valid ID	None	EISA or PCI board in slot that should contain an ISA board.	Run the System Configuration Utility and correct.
177-Configuration Not Complete	None	Incomplete System Configuration.	Run the System Configuration Utility and correct.

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178-Processor Configuration Invalid	None	Processor type or step does not match configuration memory.	Run the System Configuration Utility and correct.
179-System Revison Mismatch	None	A board was installed that has a different revision date.	Run the System Configuration Utility and correct.
201-Memory Error	None	RAM failure.	Run Diagnostics.
203-Memory Address Error	None	RAM failure.	Run Diagnostics.

Continued

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POST Error Messages *Continued*

Error Code	Beeps	Probable Source of Problem	Action
205-Cache Memory Error Option-Cache Memory Error	None	Cache memory error. Option Cache Memory Error.	Replace the processor board in the slot indicated. Replace the option cache board.
206-Cache Controller Error	None	Cache controller failure.	Run Diagnostics.
207-Invalid Memory Configuration - Check SIMM Installation	None	Memory module installed incorrectly.	Verify placement of memory modules.
208-Invalid Memory Speed - Check SIMM Installation	1L, 1S	The speed of the memory is too slow, where: xx00 = expansion board SIMMs are too slow, or 00yy = system board SIMMs are too slow. xx and yy have same bit set.	The speed of the memory modules must be 60 or 70 ns. Verify the speed of the memory modules installed and replace.
211-Cache Switch Set Incorrectly	None	Switch not set properly during installation or upgrade.	Verify switch settings.
212-System Processor Failed/Mapped out	1S	Processor in slot x failed.	Run Diagnostics and replace failed processor.
213-Cache size Error (ProSignia VS only)	None	Invalid optional cache size.	Replace cache with 256K cache.
213-System Processor Not Installed	1S	System processor configured for slot indicated is missing.	Install processor in the slot indicated or run the System Configuration Utility to remove the processor from the *.CFG* file.
301-Keyboard Error	None	Keyboard failure.	Turn off the computer, then reconnect the keyboard.

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301-Keyboard Error or Test Fixture Installed	None	Keyboard failure.	Replace the keyboard.
ZZ-301-Keyboard Error	None	Keyboard failure. (*ZZ* represents the Keyboard Scan Code.)	1. A key is stuck. Try to free it. 2. Replace the keyboard.
303-Keyboard Controller Error	None	System board, keyboard, or mouse controller failure.	Check with your Authorized Compaq Reseller.

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POST Error Messages *Continued*

Error Code	Beeps	Probable Source of Problem	Action
304-Keyboard or System Unit Error	None	Keyboard, keyboard cable, or system board failure.	1. Make sure the keyboard is attached. 2. Run Diagnostics to determine which is in error. 3. Replace the part indicated.
40X-Parallel Port X Address Assignment Conflict	2S	Both external and internal ports are assigned to parallel port X.	Run the System Configuration Utility.
402-Monochrome Adapter Failure	1L,2S	Monochrome display controller.	Replace the monochrome display controller.
501-Display Adapter Failure	1L,2S	Video display controller.	Replace the video board.
601-Diskette Controller Error	None	Diskette controller circuitry failure.	1. Make sure the diskette drive cables are attached. 2. Replace the diskette drive and/or cable. 3. Replace the system board.
605-Diskette Drive Type Error	2S	Mismatch in drive type.	Run the System Configuration Utility to set diskette type correctly.
702-A coprocessor has been detected that was not reported by CMOS.	None	Installed coprocessor not configured.	Run the System Configuration Utility and correct.
703-CMOS reports a coprocessor that has not been detected	2S	Coprocessor or configuration error.	1. Run the System Configuration Utility and correct. 2. Replace the coprocessor.

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1151-Com Port 1 Address Assignment Conflict	2S	Both external and internal serial ports are assigned to COM1.	Run the System Configuration Utility and correct.
1152-Com Port 2, 3, or 4 Address Assignment Conflict	2S	Both external and internal serial ports are assigned to COM2, COM3 or COM4.	Run the System Configuration Utility and correct.

Continued

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POST Error Messages *Continued*

Error Code	Beeps	Probable Source of Problem	Action
1600-Server Manager/R Failure	None	Server Manager/R board failure. Error code displays after error message.	Run Diagnostics. Replace failed assembly as indicated or contact your service provider.
1610-Temperature violation detected. Waiting for system to cool	2S	Ambient system temperature too hot.	Check fan in system environment.
1611-Fan failure detected	2S	Required fan not installed or spinning.	Check fans.
1612-Primary power supply failure.	2S	Primary power supply has failed.	Replace power supply as soon as possible.
1703-SCSI Cable Error Detected	None	Internal SCSI cable not attached to system connector.	Attach terminated cable or internal SCSI cable.
1730-Fixed Disk 0 does not support DMA Mode	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1731-Fixed Disk 1 does not support DMA Mode	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1740-Fixed Disk 0 failed Set Block Mode command	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1741-Fixed Disk 1 failed Set Block Mode command	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1750-Fixed Disk 0 failed Identify command	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1751-Fixed Disk 1 failed Identify command	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1760-Fixed Disk 0 does not support Block Mode	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1761-Fixed Disk 1 does not support Block Mode	None	Fixed disk drive error.	Run the System Configuration Utility and correct.

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1771-Primary Disk Port Address Assignment Conflict	None	Internal and external hard drive controllers are both assigned to the primary address.	Run the System Configuration Utility and correct.
1772-Secondary Disk Port Address Assignment Conflict	None	Address Assignment Conflict. Internal and external hard drive controllers are both assigned to the secondary address.	Run the System Configuration Utility and correct.

Continued

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POST Error Messages *Continued*

Error Code	Beeps	Probable Source of Problem	Action
1773-Primary Fixed Disk Port Assignment Conflict	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1776-Drive Array - SCSI Port Termination Error	None	External and internal SCSI drives are both configured to Port 1.	Re-configure drives.
1777-Drive Array Error	None	Cooling fan failure, internal temperature alert or open cover.	Inspect for cooling fan failure or open cover.
1778-Drive Array resuming Automatic Data Recovery process	None	This message appears whenever a controller reset or power cycle occurs while Automatic Data Recovery is in progress.	No action necessary.
1779-Drive Array Controller detects replacement drives	None	Intermittent drive failure and/or possible loss of data.	If this message appears and drive *X* has not been replaced, this indicates an intermittent drive failure. This message also appears once immediately following drive replacement whenever data must be restored from backup.
1780-Disk 0 Failure	None	Hard drive/format error.	Run Diagnostics. Replace failed assembly as indicated or contact your service provider.
1781-Disk 1 Failure	None	Hard drive/format error	Run Diagnostics. Replace failed assembly as indicated or contact your service provider.

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1782-Disk Controller Failure	None	Hard disk drive circuitry error.	Run Diagnostics. Replace failed assembly as indicated or contact your service provider.
1784-Drive Array Drive Failure, Physical Drive	None	Defective drive and/or cables.	Check for loose cables. Replace defective drive *X* and/or cable(s).
1785-Drive Array not Configured	None	Configuration error.	Run the System Configuration Utility and correct.

Continued

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POST Error Messages *Continued*

Error Code	Beeps	Probable Source of Problem	Action
1786-Drive Array Recovery Needed The following drive(s) need Automatic Data Recovery: Drive *X* Select "F1" to continue with recovery of data to drive(s). Select "F2" to continue without recovery of data to drive(s).	None	Interim Data Recovery mode. Data has not been recovered yet.	Press **F1** key to allow Automatic Data Recovery to begin. Data will automatically be restored to drive *X* now that the drive has been replaced or now seems to be working. -Or- Press the **F2** key and the system will continue to operate in the Interim Data Recovery mode.
1787-Drive Array Operating in Interim Recovery Mode. Physical drive replacement needed: Drive *X*	None	Hard drive *X* failed or cable is loose or defective. Following a system restart, this message reminds you that drive *X* is defective and fault tolerance is being used.	1. Replace drive *X* as soon as possible. 2. Check loose cables. 3. Replace defective cables.
*1788-Incorrect Drive Replaced: Drive *X* Drive(s) were incorrectly replaced: Drive *Y* Select "F1" to continue - drive array will remain disabled. Select "F2" to reset configuration - all data will be lost.	None	Drives are not installed in their original positions, so the drives have been disabled. *See* note below.	Reinstall the drives correctly as indicated. Press **F1** to restart the computer with the drive array disabled. -Or- Press **F2** to use the drives as configured and lose all the data on them.

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***NOTE**: The 1788 error message might also be displayed inadvertently due to a bad power cable connection to the drive or by noise on the data cable. If this message was due to a bad power cable connection, but not due to an incorrect drive replacement, repair the connection and press **F2**.
-Or-
If this message was not due to a bad power cable connection, and no drive replacement took place, this could indicate noise on the data cable. Check cable for proper routing.

Continued

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POST Error Messages *Continued*

Error Code	Beeps	Probable Source of Problem	Action
1789-Drive Not Responding, Physical Drive Check cables or replace physical drive *X*. Select "F1" to continue - drive array will remain disabled. Select "F2" to fail drive(s) that are not responding - Interim Recovery Mode will be enabled if configured for fault tolerance.	None	Cable or hard drive failure.	1. Check the cable connections. 2. If cables are connected, replace the drive. 3. If you do not want to replace the drives now, press F2.
1790-Disk 0 Error	None	Hard drive error or wrong drive type.	Run the System Configuration Utility and Diagnostics and correct.
1791-Disk 1 Error	None	Hard drive error or wrong drive type.	Run the System Configuration Utility and Diagnostics and correct.
1792-Drive Array Reports Valid Data Found in Array Accelerator. Data will automatically be written to drive array.	None	This indicates that while the system was in use, power was interrupted while data was in the Array Accelerator memory. Power was then restored within eight to ten days, and the data in the Array Accelerator was flushed to the drive array.	No action necessary; no data has been lost. Perform orderly system shutdowns to avoid data remaining in the Array Accelerator.

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1793-Drive Array - Array Accelerator Battery Depleted - Data Lost (Error message 1794 also displays.)	None	This indicates that while the system was in use, power was interrupted while data was in the Array Accelerator memory. Array Accelerator batteries failed. Data in Array Accelerator has been lost.	Power was not restored within eight to ten days. Perform orderly system shutdowns to avoid data remaining in the Array Accelerator.

Continued

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POST Error Messages *Continued*

Error Code	Beeps	Probable Source of Problem	Action
1794-Drive Array - Array Accelerator Battery Charge Low. Array Accelerator is temporarily disabled. Array Accelerator will be re-enabled when battery reaches full charge.	None	This is a warning that the battery charge is below 75%. Posted writes are disabled.	Replace the Array Accelerator board if batteries do not recharge within 36 power-on hours.
1795-Drive Array - Array Accelerator Configuration Error. Data does not correspond to this drive array. Array Accelerator is temporarily disabled.	None	This indicates that while the system was in use, power was interrupted while data was in the Array Accelerator memory. The data stored in the Array Accelerator does not correspond to this drive array.	1. Match the Array Accelerator to the correct drive array. -Or- 2. Run the System Configuration Utility to clear the data in the Array Accelerator.
1796-Drive Array - Array Accelerator Not Responding. Array Accelerator is temporarily disabled.	None	Array Accelerator is defective or has been removed.	1. Check that the Array Accelerator is properly seated. 2. Run the System Configuration Utility to re-configure the array controller without the Array Accelerator.
1797-Drive Array - Array Accelerator Read Error Occurred. Data in Array Accelerator has been lost. Array Accelerator is disabled.	None	Hard parity error while reading data from posted writes memory.	Enable Array Accelerator.

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1798-Drive Array - Array Accelerator Write Error Occurred. Array Accelerator is disabled.	None	Hard parity error while writing data to posted writes memory.	Enable Array Accelerator.

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POST Error Messages *Continued*

Error Code	Beeps	Probable Source of Problem	Action
1799-Drive Array - Drive(s) Disabled due to Array Accelerator Data Loss. Select "F1" to continue with logical drives disabled. Select "F2" to accept data loss and to re-enable logical drives.	None	Volume failed due to loss of data in posted-writes memory.	Press F1 to continue with logical drives disabled or F2 to accept data loss and re-enable logical drive.
	2L,2S	Power is cycled. Temperature too hot. Processor fan not installed or spinning.	Check fans.
(Run System Configuration Utility = "F10" key)	None	A configuration error occurred during POST.	Press F10 to run System Configuration Utility.
No keyboard present	None	None.	
Warning - Move bridge card in slot *x* to available slot 4, 5, 6 (*x* = 1, 2, or 3)	None	Bridge card detected in slot 1, 2, or 3.	Move bridge card to slot 4, 5, or 6.
(RESUME = "F1" KEY)	None	As indicated to continue.	Press the F1 key.

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Diagnostics (DIAGS)

Diagnostic error codes occur if the system recognizes a problem while running the Diagnostics program. These error codes help identify possible defective subassemblies.

Tables 3-2 through 3-17 list possible error codes, a description of the error condition, and the action required to resolve the error condition.

In each case, the Recommended Action column lists the steps necessary to correct the problem. After completing each step, run the Diagnostics program to verify whether the error condition has been corrected. If the error code reappears, perform the next step, then run the Diagnostics program again. Follow this procedure until the Diagnostics program no longer detects an error condition.

If you encounter an error condition, complete the following steps before starting problem isolation procedures:

1. Ensure that there is proper ventilation. The computer should have approximately 12 inches (30.5 cm) clearance at the front and back of the system unit.
2. Turn off the computer and peripheral devices.
3. Disconnect any peripheral devices other than the monitor and keyboard. Do not disconnect the printer if you want to test it or use it to log error messages.
4. Delete the power-on password, if set. You will know that the power-on password is set when a key icon appears on the screen when POST completes. If this occurs, you must enter the password to continue. To delete the password, type the current password and press the **Enter** key.
5. If you do not have access to the password, you must disable the power-on password by using the Password Disable switch on the system board.
6. When instructed by Diagnostics, install a loopback plug (Part Number 142054-001).
7. Run the latest version of Diagnostics.

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Table 3-2
Primary Processor Test Error Codes

Error Code	Description	Recommended Action
101-xx	CPU test failed	Replace the processor board and retest.
103-xx 104-xx 105-xx 106-xx	DMA page registers test failed Interrupt controller master test failed Port 61 error Keyboard controller self-test failed	For error codes 103-xx through 106-xx, replace the processor board and retest.
107-xx 108-xx 109-xx	CMOS RAM test failed CMOS interrupt test failed CMOS clock load data test failed	The following steps apply to error codes 107-xx through 109-xx. 1. Replace the battery/clock module and retest. 2. Replace the system board and retest.
110-xx 111-xx 112-xx 113-xx	Programmable timer load data test failed Refresh detect test failed Speed test slow mode out of range Protected mode test failed	For error codes 110-xx through 113-xx, replace the system board and retest.
114-xx	Speaker test failed	1. Verify the speaker connection and retest. 2. Replace the speaker and retest. 3. Replace the system board and retest.
116-xx	Cache test failed	Replace the system board and retest.

Continued

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Table 3-2 Primary Processor Test Error Codes *Continued*

Error Code	Description	Recommended Action
199-xx	Installed devices test failed	1. Check the system configuration and retest. 2. Verify cable connections and retest. 3. Check switch and/or jumper settings and retest. 4. Run the Configuration utility and retest. 5. Replace the processor board and retest. 6. Replace the system board and retest.

Table 3-3
Memory Test Error Codes

Error Code	Description	Recommended Action
200-xx	Invalid memory configuration	Reinsert memory modules in correct location and retest.
201-xx 202-xx	Memory machine ID test failed Memory system ROM checksum failed	The following steps apply to error codes 201-xx and 202-xx: 1. Replace the system ROM and retest. 2. Replace the processor board and retest. 3. Replace the memory expansion board and retest.
203-xx 204-xx 205-xx 206-xx 210-xx	Memory write/read test failed Memory address test failed Walking I/O test failed Increment pattern test failed Random pattern test failed	The following steps apply to error codes 203-xx through 210-xx: 1. Replace the memory module and retest. 2. Replace the processor board and retest. 3. Replace the memory expansion board and retest.

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Table 3-4
Keyboard Test Error Codes

Error Code	Description	Recommended Action
301-xx	Keyboard short test, 8042 self-test failed	The following steps apply to error codes 301-xx through 304-xx: 1. Check the keyboard connection. If disconnected, turn off the computer and connect the keyboard and retest. 2. Replace the keyboard and retest. 3. Replace the system board and retest.
302-xx	Keyboard long test failed	
303-xx	Keyboard LED test, 8042 self-test failed	
304-xx	Keyboard typematic test failed	

Table 3-5
Parallel Printer Test Error Codes

Error Code	Description	Recommended Action
401-xx	Printer failed or not connected	The following steps apply to error codes 401-xx through 498-xx: 1. Connect the printer and retest. 2. Check the power to the printer and retest. 3. Install the loopback connector and retest. 4. Check the switch on the Serial/Parallel Interface board (if applicable) and retest. 5. Replace the Serial/Parallel Interface board (if applicable) and retest. 6. Replace the system board and retest.
402-xx	Printer data register failed	
403-xx	Printer pattern test failed	
498-xx	Printer failed or not connected	

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Table 3-6
Video Display Unit Test Error Codes

Error Code	Description	Recommended Action
501-xx	Video controller test failed	The following steps apply to error codes 501-xx through 516-xx: 1. Replace the monitor and retest. 2. Replace the Advanced VGA board and retest. 3. Replace the system board and retest.
502-xx	Video memory test failed	
503-xx	Video attribute test failed	
504-xx	Video character set test failed	
505-xx	Video 80 x 25 mode 9 x 14 character cell test failed	
506-xx	Video 80 x 25 mode 8 x 8 character cell test failed	
507-xx	Video 40 x 25 mode test failed	
508-xx	Video 320 x 200 mode color set 0 test failed	
509-xx	Video 320 x 200 mode color set 1 test failed	
510-xx	Video 640 x 200 mode test failed	
511-xx	Video screen memory page test failed	
512-xx	Video gray scale test failed	
514-xx	Video white screen test failed	
516-xx	Video noise pattern test failed	

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Table 3-7
Diskette Drive Error Test Codes

Error Code	Description	Recommended Action
600-xx	Diskette ID drive types test failed	The following steps apply to error codes 600-xx through 698-xx: 1. Replace the diskette and retest. 2. Check and/or replace the diskette power and signal cables and retest. 3. Replace the diskette drive and retest. 4. Replace the system board and retest.
601-xx	Diskette format failed	
602-xx	Diskette read test failed	
603-xx	Diskette write/read/compute test failed	
604-xx	Diskette random seek test failed	
605-xx	Diskette ID media failed	
606-xx	Diskette speed test failed	
607-xx	Diskette wrap test failed	
608-xx	Diskette write protect test failed	
609-xx	Diskette reset controller test failed	
610-xx	Diskette change line test failed	
694-xx	Pin 34 is not cut on 360 KB diskette drive	
697-xx	Diskette type error	
698-xx	Diskette drive speed not within limits	
699-xx	Diskette drive/media ID error	The following steps apply to 699-xx error codes: 1. Replace the media and retest. 2. Run the Configuration utility and retest.

Table 3-8
Monochrome Video Board Test Error Codes

Error Code	Description	Recommended Action
802-xx	Video memory test failed	The following steps apply to error codes 802-xx and 824-xx: 1. Replace monitor and retest. 2. Replace the Advanced VGA board and retest. 3. Replace monochrome board and retest. 4. Replace the system board and retest.
824-xx	Monochrome video text mode test failed	

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Table 3-9
Serial Test Error Codes

Error Code	Description	Recommended Action
1101-xx	Serial port test failed	The following steps apply to error codes 1101-xx and 1109-xx: 1. Check the switch settings on the Serial/Parallel Interface board (if applicable) and retest. 2. Replace the Serial/Parallel Interface board (if applicable) and retest. 3. Replace the system board and retest.
1109-xx	Clock register test failed	

Table 3-10
Modem Communications Test Error Codes

Error Code	Description	Recommended Action
1201-xx	Modem internal loopback test failed	The following steps apply to error codes 1201-xx through 1210-xx: 1. Refer to the modem documentation for correct setup procedures and retest. 2. Check the modem line and retest. 3. Replace the modem and retest.
1202-xx	Modem time-out test failed	
1203-xx	Modem external termination test failed	
1204-xx	Modem auto originate test failed	
1206-xx	Dial multi-frequency tone test failed	
1210-xx	Modem direct connect test failed	

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Table 3-11
Fixed Disk Drive Test Error Codes

Error Code	Description	Recommended Action
1700-xx	Fixed disk ID drive types test failed	The following steps apply to error codes 1700-xx through 1799-xx: 1. Run the Configuration Utility and verify the drive type. 2. Replace the fixed disk drive signal and power cables and retest. 3. Replace the fixed disk drive controller and retest. 4. Replace the fixed disk drive and retest. 5. Replace the system board and retest.
1701-xx	Fixed disk format test failed	
1702-xx	Fixed disk read test failed	
1703-xx	Fixed disk write/read/compare test failed	
1704-xx		
1705-xx	Fixed disk random seek test failed	
1708-xx	Fixed disk controller test failed	
1709-xx	Fixed disk format bad track test failed	
1710-xx	Fixed disk reset controller test failed	
1715-xx	Fixed disk park head test failed	
1716-xx	Fixed disk head select test failed	
1717-xx	Fixed disk conditional format test failed	
1719-xx	Fixed disk ECC* test failed	
1736-xx	Fixed disk drive power mode test failed	
1799-xx	Drive Monitoring failed	
	Invalid fixed disk drive type failed	

* Error Checking and Correcting

Table 3-12
CD-ROM Drive Test Error Codes

Error Code	Description	Recommended Action

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1800-xx 1803-xx 1805-xx 1806-xx 1808-xx 1823-xx	CD-ROM ID failed CD-ROM Power failed CD-ROM Read failed CD-ROM SA/Media failed CD-ROM Controller failed CD-ROM random read failed	The following steps apply to error codes 1800-xx through 1823-xx: 1. Replace the CD-ROM and retest. 2. Check and/or replace the signal cable and retest. 3. Check the switch settings on the adapter board (if applicable). 4. Replace the tape adapter board (if applicable) and retest. 5. Replace the CD-ROM drive and retest. 6. Replace the system board and retest.

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Table 3-13
Tape Drive Test Error Codes

Error Code	Description	Recommended Action
1900-xx	Tape ID failed	The following steps apply to error codes 1900-xx through 1906-xx: 1. Replace the tape cartridge and retest. 2. Check and/or replace the signal cable and retest. 3. Check the switch settings on the adapter board (if applicable). 4. Replace the tape adapter board (if applicable) and retest. 5. Replace the tape drive and retest. 6. Replace the system board and retest.
1901-xx	Tape servo write failed	
1902-xx	Tape format failed	
1903-xx	Tape drive sensor test failed	
1904-xx	Tape BOT/EOT test failed	
1905-xx	Tape read test failed	
1906-xx	Tape write/read/compare test failed	

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Table 3-14
Advanced VGA Board Test Error Codes

Error Code	Description	Recommended Action
2402-xx	Video memory test failed	The following steps apply to error codes 2402-xx through 2456-xx: 1. Run the Configuration utility. 2. Replace the monitor and retest. 3. Replace the Advanced VGA board or other video board and retest. 4. Replace the system board and retest.
2403-xx	Video attribute test failed	
2404-xx	Video character set test failed	
2405-xx	Video 80 x 25 mode 9 x 14 character cell test failed	
2406-xx	Video 80 x 25 mode 8 x 8 character cell test failed	
2407-xx	Video 40 x 25 mode test failed	
2408-xx	Video 320 x 320 mode color set 0 test failed	
2409-xx	Video 320 x 320 mode color set 1 test failed	
2410-xx	Video 640 x 200 mode test failed	
2411-xx	Video screen memory page test failed	
2412-xx	Video gray scale test failed	
2414-xx	Video white screen test failed	
2416-xx	Video noise pattern test failed	
2417-xx	Lightpen text mode test failed, no response	
2418-xx	ECG/VGC memory test failed	
2419-xx	ECG/VGC ROM checksum test failed	
2420-xx	ECG/VGC attribute test failed	
2421-xx	ECG/VGC 640 x 200 graphics mode test failed	
2422-xx	ECG/VGC 640 x 350 16-color set test failed	
2423-xx	ECG/VGC 640 x 350 64-color test failed	
2424-xx	ECG/VGC monochrome text mode test failed	
2425-xx	ECG/VGC monochrome graphics mode test failed	
2431-xx	640 x 480 graphics test failure	
2432-xx	320 x 200 graphics (256-color mode) test failure	
2448-xx	Advanced VGA Controller test failed	
2451-xx	132-column Advanced VGA test failed	
2456-xx	Advanced VGA 256-Color test failed	

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2458-xx	Advanced VGA Bit BLT Test	The following steps apply to error codes 2458-xx through 2480-xx: 1. Run Setup. 2. Replace the system board and retest.
2468-xx	Advanced VGA DAC Test	
2477-xx	Advanced VGA Data Path Test	
2480-xx	Advanced VGA DAC Test	

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Table 3-15
NetFlex-2 ENET-TR Controller and
NetFlex-2 Token Ring Controller Test Error Codes

Error Code	Description	Recommended Action
6000-xx	Network card ID failed	The following steps apply to error codes 6000-xx through 6089-xx: 1. Check the controller installation in the EISA slot. 2. Check the interrupt type and number setting. 3. Check the media connection at the controller and MAU*. 4. Check the media speed (4/16) and type (UTP/STP**) settings. 5. Check the MAU, cabling, or other network components. 6. Replace the controller.
6001-xx	Network card setup failed	
6002-xx	Network card transmit failed	
6014-xx	Network card Configuration failed	
6016-xx	Network card Reset failed	
6028-xx	Network card Internal failed	
6029-xx	Network card External failed	
6089-xx	Network card Open failed	
		* MAU = Multistation Access Unit ** UTP/STP = Unshielded Twisted Pair/Shielded Twisted Pair.

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Table 3-16
Server Manager/R Board Test Error Codes

Error Code	Description	Recommended Action
7000-11	Processor (80186 Timer)	Replace the Server Manager/R board and retest for error codes 7000-11 through 7000-27.
7000-12	Processor (80186 Registers)	
7000-13	Processor (Watch Dog Timer)	
7000-14	Processor (8570 RAM)	
7000-15	Processor (8570 RTC)	
7000-21	Memory	
7000-22	Memory Write/Read	
7000-23	Memory Address	
7000-24	Memory Refresh Alert	
7000-25	Memory Increment	
7000-26	Memory Random Data	
7000-27	Memory Disturb Address	
7000-28	Memory HBM	Replace the Server Manager/R board and retest for error codes 7000-28 through 7000-46.
7000-33	HBM IO	
7000-34	HBM BMIC	
7000-35	HBM Video	
7000-41	ser_int	
7000-42	ser_int	
7000-43	ser_ext	
7000-44	ser_ext	
7000-45	ser_ext_int	
7000-46	ser_ext_int	
7000-51	mdm_int	Replace the Server Manager/R board Enhanced 2400-Baud Integrated Modem and retest for error codes 7000-51 through 7000-57.
7000-52	mdm_int	
7000-53	mdm_ext	
7000-54	mdm_ext	
7000-55	mdm_ext_int	
7000-56	mdm_ext_int	
7000-57	mdm\c\analog	
7000-61	Voice/DTMF Internal Loopback	Replace the Server Manager/R board Voice ROM for 7000-61 and 7000-62 error codes.
7000-62	Voice/DTMF Internal Loopback	
7000-78	Host ADC Measurements	Replace the Server Manager/R board battery for 7000-78 and 7000-79 error codes.
7000-79	Battery	

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Table 3-17
Pointing Device Interface Test Error Codes

Error Code	Description	Recommended Action
8601-xx	Pointing Device Interface test failed	The following steps apply for 8601-xx error codes: 1. Replace with a working pointing device and retest. 2. Replace the system board and retest.

Drive Array Advanced Diagnostics (DAAD)

Drive Array Advanced Diagnostics (DAAD) is a DOS-based tool designed to run on all Compaq products that contain a Smart SCSI Array Controller using Fast-SCSI-2 Drives. The error messages and codes listed include all codes generated by Compaq products. Your system will generate only those codes that are applicable to your configuration and options. The two main functions of DAAD are to collect all possible information about the array controllers in the system and to offer a list of all detected problems.

NOTE: Refer to the *Drive Array Advanced Diagnostics User Guide* for complete details and procedures about this diagnostic tool.

DAAD works by issuing multiple commands to the array controllers to determine if a problem exists. This data can then be saved to a file and, for severe situations, this file can be sent to Compaq for analysis. In most cases, DAAD will provide enough information to initiate problem resolution immediately.

NOTE: DAAD does not write to the drives or destroy data. It does not change or remove configuration information.

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Starting DAAD

To start DAAD:

1. Insert the DAAD diskette into drive A and reboot the system. If you are at the DOS prompt, enter the following:

   A:DAAD

2. A dialog box displays indicating the version of DAAD installed. Press the **Enter** key to continue, or press the **Esc** key to exit without continuing.

3. If you continue, a Please Wait panel displays indicating that DAAD is identifying the system parameters.

   DAAD gathers all the information it can from all of the array controllers in the system. The time it takes to gather this information depends on the size of your system.

CAUTION: Do not cycle the power because the utility must perform low-level operations that, if interrupted, could cause the controller to revert to a previous level of firmware if the firmware was soft-upgraded.

4. Another Please Wait panel displays to indicate that the utility is identifying the ROM version. When this is complete, the main DAAD screen displays.

   NOTE: To generate a DAAD report without starting the interactive portion of the utility, at the DOS prompt enter the following:

   DAAD *filename*

   where *filename* is the name of the file or report.

DAAD Diagnostic Messages

The following is a description of the diagnostic messages that may be displayed in the dialog box of the Diagnosis menu. Included with each message is a probable cause and a probable solution or troubleshooting routine.

To view the problems detected by DAAD, select the Diagnosis button. If DAAD found no problems, a message, "No Problems Detected," will display.

Accelerator board not detected

The array controller board did not detect the presence of a configured array accelerator board.

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Install an array accelerator board onto the array controller. If you have an array accelerator board installed, check the seating to ensure that it has been properly installed onto the array controller board. You may need to run the Compaq System Configuration Utility and disable the array accelerator board to get this message off the screen.

Accelerator error log

This is a list of the last 32 parity errors on transfers between the array controller board transfer buffer and memory on the array accelerator board. The starting memory address, transfer count, and operation (read and write) displays.

If there are a number of these parity errors, you may need to replace the array accelerator board.

Accelerator parity read errors: *n*

This message displays the number of times that read memory parity errors were detected during transfers between the array controller board transfer buffer and memory on the array accelerator board.

If there are a number of these parity errors, you may need to replace the array accelerator board.

Accelerator parity write errors: *n*

This message displays the number of times that write memory parity errors were detected during transfers between the array controller board transfer buffer and memory on the array accelerator board.

If there are a number of these parity errors, you may need to replace the array accelerator board.

Accelerator status: Permanently disabled

The array accelerator board has been permanently disabled. It will remain disabled until it is reinitialized using the System Configuration Utility.

Check the Disable Code field. Run the System Configuration Utility to reinitialize the array accelerator board.

Accelerator status: Possible data loss in cache

Possible data loss was detected during power-up due to all of the batteries being below the sufficient voltage level and no presence of the identification signatures on the array accelerator board.

There is no way to determine if dirty or bad data was in the cache and is now lost.

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Accelerator status: Temporarily disabled

The array accelerator board has been temporarily disabled.

Check the Disable Code field.

Accelerator status: Unrecognized status

A status returned from the array accelerator board that DAAD does not recognize.

Call your Authorized Compaq Reseller for the latest copy of DAAD.

Accelerator status: Valid data found at reset

Valid data was found in the posted write memory at re-initialization. The data will be flushed to disk.

This is *not* an error or data loss condition. No action needs to be taken.

Accelerator status: Warranty alert

A catastrophic problem has occurred with the array accelerator board. Refer to the other messages on the Diagnostics screen for the exact meaning of this message.

Replace the array accelerator board.

Battery pack *X* below reference voltage

The indicated battery pack is below the required voltage levels.

Allow sufficient time for the batteries to recharge (36 hours). If the batteries have not recharged after 36 hours, replace the battery pack.

Battery *X* not fully charged

The battery is not fully charged.

If 75% of the batteries present are fully charged, the array accelerator is fully operational. If more than 75% of the batteries are *not* fully charged, allow 36 hours to recharge them.

Board not attached

The array controller board has been configured for use with an array accelerator board, but one is currently not attached.

Locate the original array accelerator board and attach it to the array controller board.

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CMOS present, controller not detected

EISA nonvolatile RAM has a configuration for an array controller but there is no board in this slot. Either a board has been removed from the system or a board has been placed in the wrong slot.

Place the array controller in the proper slot or run the System Configuration Utility to re-configure nonvolatile RAM to reflect the removal or new position.

Compatibility port problem detected

You have the compatibility port configured for this array controller. When DAAD was verifying this interface, a serious problem was detected.

A hardware problem has occurred and you should replace the array controller.

Configuration signature is zero

DAAD detected that nonvolatile RAM contains a configuration signature that is zero. Old versions of the System Configuration Utility could cause this.

Run the latest version of System Configuration Utility to configure the controller and nonvolatile RAM.

Configuration signature mismatch

The array accelerator board has been configured for a different array controller board. The configuration signature on the array accelerator board does not match the one stored on the array controller board.

To recognize the array accelerator board, run the System Configuration Utility.

Controller communication failure occurred

DAAD was unable to successfully issue commands to the controller in this slot.

Controller detected. CMOS not present

The EISA nonvolatile RAM is not configured.

Run the System Configuration Utility to configure the nonvolatile RAM.

Controller firmware needs upgrading

The controller firmware is below the latest recommended version.

Call your Authorized Compaq Reseller to obtain the latest upgraded firmware.

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Controller firmware needs upgrading (DAAD Error 102)

You have the correct controller; however, the array controller firmware version should be greater than 1.26.

Call your Authorized Compaq Reseller to obtain the latest firmware.

Controller is not configured

The controller is not configured. If the controller was previously configured and you change drive locations, there may be a problem with the placement of the drives. DAAD examines each physical drive and looks for drives that have been moved to a different drive bay.

Look for the messages that indicate which drives have been moved. If none appear and drive swapping did not occur, run the System Configuration Utility to configure the controller and nonvolatile RAM. *Do not* run the System Configuration Utility if you believe drive swapping has occurred.

Controller needs replacing (DAAD Error 102)

The array controller firmware is less than version 0.96.

Replace the controller as soon as possible.

Controller needs replacing (DAAD Error 104)

The Intelligent Array Expansion System firmware is less than version 1.14.

Replace the controller as soon as possible.

Controller reported POST error. Error Code: *x*

The controller returned an error from its internal Power-On Self-Tests.

Replace the controller.

Controller restarted with a signature of zero

DAAD did not find a valid configuration signature to use to get the data. Nonvolatile RAM may not be present (unconfigured) or the signature present in nonvolatile RAM may not match the signature on the controller.

Run the System Configuration Utility to configure the controller and nonvolatile RAM.

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Disable command issued

Posted writes have been disabled by the issuing of the Accelerator Disable command. This occurred because of an operating system device driver.

Restart the system. Run the System Configuration Utility to reinitialize the array accelerator board.

Drive (bay) *X* needs replacing (DAAD Error 102)

The 210-megabyte hard drive installed in the computer has firmware version 2.30 or 2.31.

Replace the drive.

Drive Monitoring features are unattainable

DAAD was unable to get the monitor and performance data due to a fatal command problem such as drive time-out, or was unable to get the data due to these features not being supported on the controller.

Check for other errors (for example, time-outs). If no other errors occur, upgrade the firmware to a version that supports monitor and performance, if desired.

Drive Monitoring is NOT enabled for drive bay *X*

The monitor and performance features have not been enabled.

Run the Compaq Diagnostics Utility 8.05 or higher to initialize the monitor and performance features.

Drive time-out occurred on physical drive bay *X*

DAAD issued a command to a physical drive and the command was never acknowledged.

The drive or cable may be bad. Check the other error messages on the Diagnostics screen to determine resolution.

Drive (bay) *X* firmware needs upgrading

The firmware on this physical drive is below the latest recommended version.

Call your Authorized Compaq Reseller to obtain the latest upgraded firmware.

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Drive (bay) *X* has invalid M&P stamp

The physical drive has invalid monitor and performance data present.

Run the latest Compaq Diagnostics Utility to properly initialize this drive.

Drive *X* indicates position *Y*

This message indicates a physical drive is not in the drive bay for which it was originally configured (that is, the drive is not in the correct location).

Examine the graphical drive representation on DAAD to determine proper drive locations. Remove drive X and place it in drive position Y. Rearrange the drives according to the DAAD instructions.

Drive (bay) *X* RIS copy mismatch

The copies of the RIS on this drive do not match.

This drive may need to be replaced. Check for other errors.

Drive (bay) *X* upload code not readable

An error occurred while DAAD was trying to read the upload code information from this drive.

If there were multiple errors, this drive may need to be replaced.

Duplicate write memory error

Data could not be written to the array accelerator board in duplicate due to the detection of parity errors. This is *not* a data loss situation.

Replace the array accelerator board.

Error occurred reading RIS copy from drive (bay) *X*

An error occurred while DAAD was trying to read the RIS from this drive.

If there were multiple errors, this drive may need to be replaced.

FYI: Drive (bay) *X* is non-Compaq supplied

The installed drive was not supplied by Compaq.

If problems exist with this drive, replace it with a Compaq drive.

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Identify controller data did not match with CMOS

The identify controller data from the array controller did not match with the information stored in nonvolatile RAM. This could occur if new, previously configured drives have been placed in a system that has also been previously configured. This situation could also occur if the firmware on the controller has been upgraded and the System Configuration Utility was not run.

Check the identify controller data under the Inspect Utility. If the firmware version field is the only thing different between the controller and nonvolatile RAM data, this is not a problem. Otherwise run the System Configuration Utility.

Identify logical drive data did not match with CMOS

The identify unit data from the array controller did not match with the information stored in nonvolatile RAM. This could occur if new, previously configured drives have been placed in a system that has also been previously configured.

Run the System Configuration Utility to configure the controller and nonvolatile RAM.

Insufficient adapter resources

The adapter does not have sufficient resources to perform operations to the array accelerator board. Drive rebuild may be occurring.

Operate the system without the array accelerator board until the drive rebuild completes.

Less than 75% batteries at sufficient voltage

The operation of the array accelerator board has been disabled due to less than 75% of the battery packs being at the sufficient voltage level.

Allow sufficient time for the batteries to recharge (36 hours). If the batteries have not recharged after 36 hours, replace the array accelerator board.

Logical drive *X* failed due to cache error

This logical drive failed due to a catastrophic cache error.

Replace the array accelerator board and re-configure using the System Configuration Utility.

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Logical Drive *X* status = FAILED

This status could be issued for several reasons. If this logical drive is configured for No Fault Tolerance and one or more drives fail, this status will occur. If mirroring is enabled, and any two mirrored drives fail, this status will occur. If Data Guarding is enabled, and two or more drives fail in this unit, this status will occur. This status may also occur if another configured logical drive is in the WRONG DRIVE REPLACED or LOOSE CABLE DETECTED state.

Check for drive failures, wrong drive replaced, or loose cable messages. If there was a drive failure, replace the failed drive(s) and then restore the data for this logical drive from the tape backup. Otherwise, follow the wrong drive replaced or loose cable detected procedures.

Logical Drive *X* status = INTERIM RECOVERY

A physical drive in this logical drive has failed. The logical drive is operating in interim recovery mode and is vulnerable.

Replace the failed drive as soon as possible.

Logical Drive *X* status = LOOSE CABLE DETECTED

A physical drive has a cabling problem.

Turn the system off and attempt to reattach the cable onto the drive. If this does not work, replace the cable.

Logical Drive *X* status = NEEDS RECOVER

A physical drive in this logical drive has failed and has now been replaced. This drive needs to be rebuilt from the mirror drive or the parity data.

When booting up the system, select the *F1 - rebuild drive* option to rebuild the replaced drive.

Logical Drive *X* status = OVERHEATED

The temperature of the Intelligent Array Expansion System drives is beyond safe operating levels and it has shut down to avoid damage.

Check the fans and the operating environment.

Logical Drive *X* status = OVERHEATING

The temperature of the Intelligent Array Expansion System drives is beyond safe operating levels.

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Check the fans and the operating environment.

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Logical Drive X status = RECOVERING

A physical drive in this logical drive has failed and has now been replaced. The replaced drive is rebuilding from the mirror drive or the parity data.

Nothing needs to be done. Normal operations can occur.

Logical Drive *X* status = WRONG DRIVE REPLACED

A physical drive in this logical drive has failed. The incorrect drive was replaced.

Replace the drive that was incorrectly replaced. Then, replace the original drive that failed with a new drive. *Do not* run the System Configuration Utility to reconfigure—you will lose data on the drive.

Mirror data miscompare

Data was found at re-initialization in the posted write memory, however, the mirror data compare test failed resulting in data being marked as invalid. Data loss is possible.

Replace the array accelerator board.

Mirrored memory location errors

Soft errors occurred when attempting to read the same data from both sides of the mirrored memory. Data loss will occur.

Replace the array accelerator board.

No configuration for Accelerator Board

The array accelerator board has not been configured.

If the array accelerator board is present, run the System Configuration Utility to configure the board.

Physical Drive (bay) *X* error occurred

This message displays detailed information on any drive errors that were returned to DAAD while issuing drive commands.

Check for other error conditions.

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Physical drive (bay) *X* has loose cable

The array controller could not communicate with this drive at power-up. This drive has not previously failed.

Check all cable connections first. The cables could be bad, loose, or disconnected. Turn on the system and attempt to reconnect data/power cable to the drive. If this does not work, replace the cable. If replacing the cable does not work, the drive may need to be replaced.

Physical drive (bay) *X* is a replacement drive

This drive has been replaced. This message displays if a drive is replaced in a fault tolerant logical volume.

If the replacement was intentional, allow the drive to rebuild.

Physical drive (bay) *X* is a replacement drive marked OK

This drive has been replaced and marked OK by the firmware. This may occur if a drive has an intermittent failure (for example, if a drive has previously failed, then when DAAD is run, the drive starts working again).

Replace the drive.

Physical drive (bay) *X* has failed

The indicated physical drive has failed.

Replace this drive.

Physical drive (bay) *X* is undergoing drive recovery

This drive is being rebuilt from the corresponding mirror or parity data.

Normal operations should occur.

Physical drive (bay) *X* was inadvertently replaced

The physical drive was incorrectly replaced after another drive failed.

Replace the drive that was incorrectly replaced and replace the original drive that failed. Do not run the System Configuration Utility and try to reconfigure – data will be lost.

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Set configuration command issued

The configuration of the array controller has been updated. The array accelerator board remains disabled until it is reinitialized.

Run the System Configuration Utility to reinitialize the array accelerator board.

Soft Firmware Upgrade required

DAAD has determined that your controller is running firmware that has been soft upgraded by the Compaq Upgrade Utility. However, the firmware running is not present on all drives. This could be caused by the addition of new drives in the system.

Run the Compaq Upgrade Utility to place the latest firmware on all drives.

Threshold for drive (bay) *X* violated

This message indicates that a monitor and performance threshold for this drive has been violated.

Check for the particular threshold that has been violated.

Threshold violations for drive (bay) *X*

This is a list of the individual thresholds that have been violated for this drive.

The drive may need to be replaced. Run the Compaq Diagnostics Utility to determine if the drive has been initialized and the threshold violation warrants drive replacement.

Unknown disable code

A code was returned from the array accelerator board that DAAD does not recognize.

Call your Authorized Compaq Reseller for the latest version of DAAD.

Warning bit detected

A monitor and performance threshold violation may have occurred. The status of a logical drive may not be OK.

Check the other error messages for an indication of the problem.

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Wrong Accelerator

This could mean that either the board was replaced in the wrong slot or placed in a system that was previously configured with another board type. Included with this message is a message indicating the type of adapter sensed by DAAD and a message indicating the type of adapter last configured in EISA nonvolatile RAM.

Check the diagnosis screen for other error messages. Run the System Configuration Utility to update the system configuration.

Rapid Recovery Services

The Compaq ProLiant provides rapid recovery services for diagnosing and recovering from errors. These tools are available for local and remote diagnosis and recovery. The following topics are discussed here:

- Automatic Server Recovery (ASR)
- Server Health Logs
- System Configuration History Files

Automatic Server Recovery

The Automatic Server Recovery (ASR) feature can be enabled to restart a Server after a critical hardware error or software error has occurred. If a critical error occurs, the Server will record the error information in the Server Health Logs, reboot the system, and initiate a call to a pager. The system can be configured for either automatic recovery or for attended local or remote access to diagnostic and configuration tools.

NOTE: ASR is available only under operating systems using the ASR drivers provided by Compaq.

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The following chart explains how ASR works:

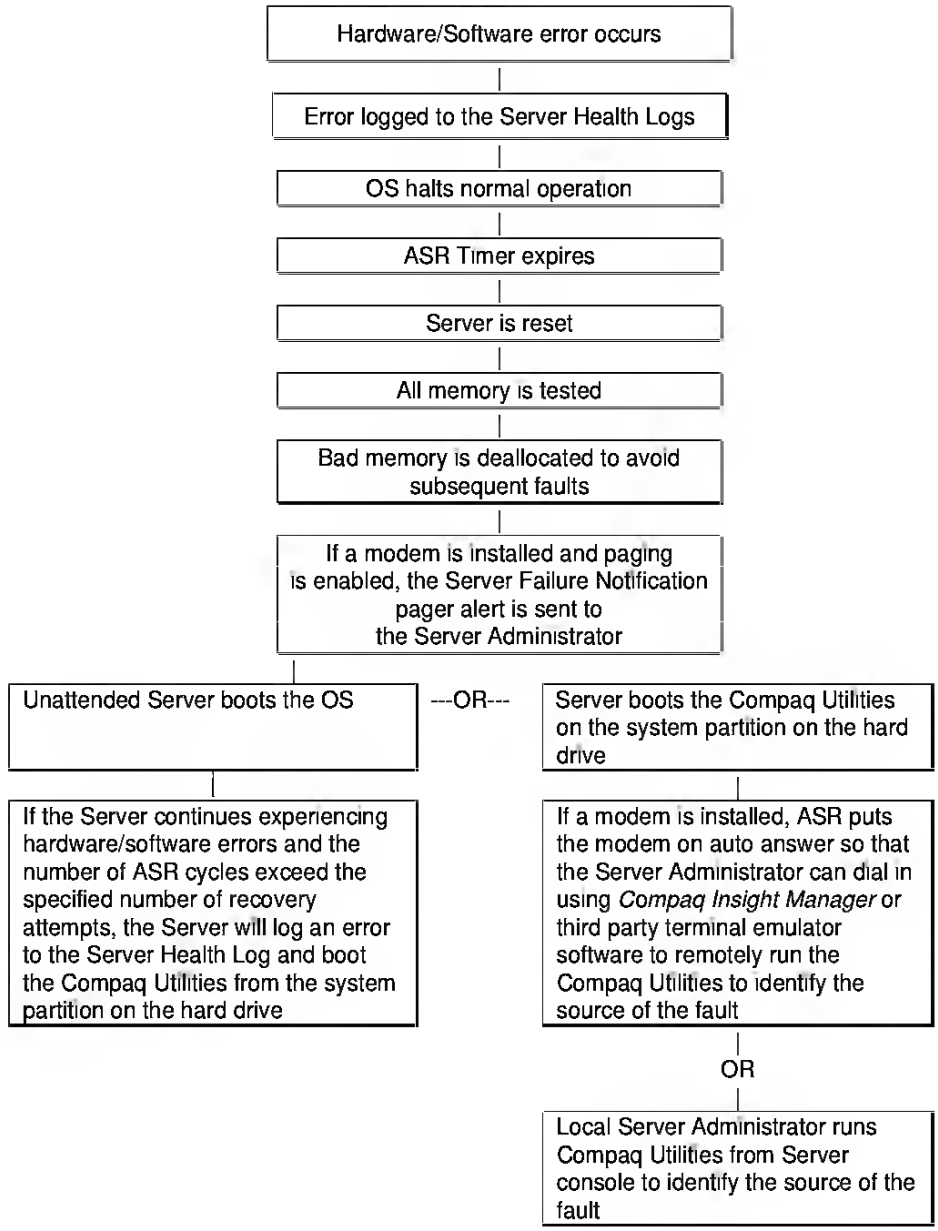
Hardware/Software error occurs
Error logged to the Server Health Logs
OS halts normal operation
ASR Timer expires
Server is reset
All memory is tested
Bad memory is deallocated to avoid subsequent faults
If a modem is installed and paging is enabled, the Server Failure Notification pager alert is sent to the Server Administrator
Unattended Server boots the OS
---OR---
Server boots the Compaq Utilities on the system partition on the hard drive
If the Server continues experiencing hardware/software errors and the number of ASR cycles exceed the specified number of recovery attempts, the Server will log an error to the Server Health Log and boot the Compaq Utilities from the system partition on the hard drive
If a modem is installed, ASR puts the modem on auto answer so that the Server Administrator can dial in using Compaq Insight Manager or third party terminal emulator software to remotely run the Compaq Utilities to identify the source of the fault
OR
Local Server Administrator runs Compaq Utilities from Server console to identify the source of the fault

Figure 3-1. Automatic Server Recovery

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Configuring the Server for Automatic Server Recovery (ASR)

When setting up the Server to use Automatic Server Recovery (ASR), you must set the ASR Timer, select the pager number to call, specify how you want the Server to recover from critical system faults, and specify when to monitor. This selection process is accomplished through the SmartStart installation process and can be modified through the Compaq System Configuration Utility.

The ASR depends on an operating system driver that routinely notifies the ASR hardware that the system is operating properly. You should set the ASR Timer to allow the ASR to wait a reasonable period of time before resetting the system and activating the recovery process after a fault occurs. If the time between ASR notifications by the driver exceeds the specified time period, it will assume a fault has occurred and initiate the recovery process.

For example, if the ASR Timer is set to 10 minutes, the system will not reset the Server unless 10 minutes elapses with no notification from the driver that the system is operating properly.

You can select to be paged (modem required) and what mode the Server will be in when it restarts after a critical error. The following sections describe the different reboot options and the system requirements for each level.

Unattended Recovery

For unattended recovery, ASR will log the error information to the Critical Error Log, reset the Server, test all memory, automatically de-allocate any bad memory blocks found, page you (if modem is present and paging is selected), and attempt to reboot the operating system. Often the Server will restart successfully, making this the ideal choice for remote locations where trained service personnel are not immediately available.

The ASR will only attempt the recovery process a limited number of times. If the Server continues to experience hardware/software errors and the number of recovery cycles exceeds the retry limit, the Server will log an error to the Critical Error Log and continue to boot the Compaq Utilities from the hard drive.

The requirements to use this level of the ASR feature are:

- Operating System with ASR support
- ASR configured to load the operating system after reboot
- Optional Hayes-compatible modem (only required for paging)

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Attended Recovery

For local or remote installations where it is desirable to supervise the recovery, ASR will log the error information to the Critical Error Log, reset the Server, test all memory, automatically de-allocate any bad memory blocks found, page you, boot the Compaq Utilities from the hard drive, and place the modem in auto answer mode. These utilities are placed on a special system utilities partition on the hard drive during the system configuration process. If a modem with an auto-answer feature is installed, you can dial in and remotely diagnose or re-configure the Server; otherwise, this can be done from the Server console. The requirements to use this level of the ASR feature are:

- Operating System with ASR support
- System Configuration Utility and Diagnostics Utility installed on the system partition of the hard drive
- ASR configured to load the Compaq Utilities after reboot
- Optional Hayes-compatible modem with auto-answer feature (only required for remote operations and paging)

For remote operations, the administrator must have access to Compaq Insight Manager or a communications software package capable of terminal emulation to a local terminal with VT100 or ANSI terminal capabilities.

> **NOTE:** If the remote site is using something other than VT100 or an ANSI terminal emulator, it is still possible to configure remotely as long as the package contains either an ANSI terminal or VT100 terminal emulator set for 8 data bits, 1 stop bit, and no parity. However, additional setup not outlined in this document may be required, and functionality may be reduced.

ASR Security

The standard Compaq ProLiant security password features function differently during ASR than during a typical system startup.

During ASR the system will not prompt for the Power-On Password. This allows the ASR to restart the Operating System or Compaq Utilities without user intervention.

To maintain system security, the Server should be set to boot in Network Server Mode (an option in the System Configuration Utility). This option ensures that the Server keyboard is locked until you enter the Keyboard Password.

You should also select an Administrator Password (an option in the System Configuration Utility). During attended ASR (local or remote), you must enter this Administrator Password before any modifications can be made to the Server configuration.

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Server Health Logs

The Server Health Logs contain information to help identify and correct any Server failures and correlate hardware changes with Server failure. The Server Health Logs are stored in nonvolatile RAM and consist of the Critical Error Log and the Revision History Table.

If errors occur, information about the errors is automatically stored in the Critical Error Log.

Whenever boards or components (that support revision tracking) are updated to a new revision, the Revision History Table will be updated.

Critical Error Log

The Critical Error Log records noncorrectable memory errors as well as catastrophic hardware and software errors that typically cause the system to fail. This information helps you quickly identify and correct the problem, minimizing downtime.

The log can be viewed through Inspect Utility, Diagnostics Utility, Compaq Insight Manager or the optional Server Manager/R. The Diagnostics Utility either resolves the error or suggests corrective action.

The Critical Error Log identifies and records all the following errors. Each error type is briefly explained below. When any of these errors are encountered, you should run the Diagnostics Utility.

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Table 3-18
Critical Error Log Error Messages

Error Message	Description
Automatic Server Recovery Base Memory Parity Error	The system detected a data error in base memory following a reset due to the Automatic Server Recovery (ASR) Timer expiration.
Automatic Server Recovery Extended Memory Parity Error	The system detected a data error in extended memory following a reset due to the ASR Timer expiration.
Automatic Server Recovery Memory Parity Error	The system ROM was unable to allocate enough memory to create a stack. Then, it was unable to put a message on the screen or continue booting the Server.
Automatic Server Recovery Reset Limit Reached	The maximum number of system resets due to the ASR timer expiration has been reached, resulting in the loading of Compaq Utilities.
Error Detected On Boot Up	The Server detected an error during the Power-On Self-Test.
NMI - Expansion Board Error	A board on the expansion bus indicated an error condition, resulting in a Server failure.
NMI - Expansion Bus Master Time-Out	A bus master type expansion board in the indicated slot did not release the bus after its maximum time, resulting in a Server failure.
NMI - Expansion Bus Slave Time-Out	A board on the expansion bus delayed a bus cycle beyond the maximum time, resulting in a Server failure.
NMI- Fail-Safe Timer Expiration	Software was unable to reset the system fail-safe timer, resulting in a Server failure.
Processor Exception	The indicated processor exception occurred.
NMI- Processor Parity Error	The processor detected a data error, resulting in a Server failure.
Server Manager Failure	An error occurred in the Server interface with the Server Manager/R.
NMI - Software Generated Interrupt Detected Error	Software indicated a system error, resulting in a Server failure.

Revision History Table

Some errors can be resolved by reviewing changes to the Compaq ProLiant configuration. The Server has an Automatic Revision Tracking (ART) feature that helps you review recent changes to the Server's configuration.

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One ART feature is the Revision History Table, which contains the hardware version number of the system board and any other EISA or PCI boards providing ART-compatible revision information. The Revision History is provided in the following format in Table 3-19.

Table 3-19
Revision History Format

	Values
Functional Revision Level	A to BC
Assembly Version	1 = Original Assembly
	2 = Second Generation Assembly
	3 = Third Generation Assembly
	4 = Fourth Generation Assembly

The Revision History Table is stored in nonvolatile RAM and is accessed through Diagnostics, Inspect, Compaq Insight Manager, and the optional Compaq Server Manager/R.

The Revision History Table feature allows precise identification of the components in a server. The table is updated when the system ROM detects a board version change in an EISA or PCI expansion slot. The table also contains complete version information on the previous configuration. This feature allows correlation of hardware changes with Server failure. The following information is stored in the Revision History Table:

- Type of board (System, EISA, or PCI)
- Slot number
- Expansion board ID
- Version

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System Configuration History Files

The System Configuration History Files, part of the ART feature, allow you to review modifications to the system configuration.

If a change has been made to the configuration file, the System Configuration Utility will keep a history of the system configuration file. The System Configuration Utility stores the three most recent configurations.

The most recent configuration of the System Configuration History Log can be displayed and printed using the Inspect Utility. All three versions can be printed for historical purposes or reinstalled through the Maintain Configuration Utility feature of the System Configuration Utility.

ROMPaq

The use of flash ROM in the Compaq ProLiant and in certain options controllers allows the firmware (BIOS) to be upgraded with system or option ROMPaq utilities. To upgrade the ROM, insert the ROMPaq diskette into drive A and cold boot the system. The ROMPaq utility will then check the system and provide a choice (if more than one exists) of ROM revisions that the system can be upgraded to. This procedure is the same for both system and option ROMPaq utilities.

CAUTION: Do not turn the power off during a firmware upgrade. A loss of power during upgrade may corrupt the upgrade.

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Chapter 4
Switch and Jumper Information

This chapter provides switch and jumper information for the Compaq ProLiant 2500 and 2500R Servers.

System I/O Board

Switch SW1 is a six-position switchbank (S1-S6) that controls the security features and configuration of the computer.

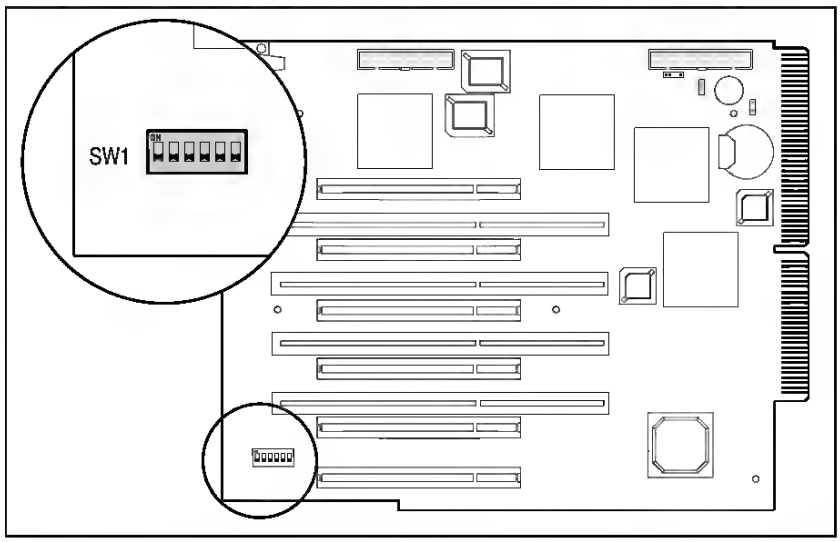

Figure 4-1. Location of Compaq ProLiant 2500 and 2500R System I/O Board Switch

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SW1 - System Maintenance Switch

The following table defines the function for each switch setting of SW1. The default positions are indicated below.

Table 4-1
System Maintenance Switch Settings - SW1

Switch	Function	Set to ON	Set to OFF
1	**Integrated Video Disable**	Disables the integrated video controller.	*Default.* Enables the integrated video controller.
2	**Configuration Lock**	Disables configuration changes.	*Default.* Enables configuration changes.
3	**Rack Mount Mode**	*Default for Compaq ProLiant 2500R.* System is installed in a rack chassis.	*Default for Compaq ProLiant 2500.* System is installed in a tower chassis.
4	**Diskette Boot Feature Enable**	Enables system booting from the diskette drive regardless of the configuration setting.	*Default.* System booting from the diskette drive is controlled by the configuration settings.
5	**Power-On Password Defeat**	Clears passwords.	*Default.* System booting is password protected if a password is set.
6	**Configuration Memory Clear**	Clears the configuration memory.	*Default.*

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Pentium Pro Processor Board

Three switchbanks, located on the Pentium Pro processor board, control the bus/core frequency ratio.

CAUTION: Setting the processor switchbanks incorrectly can result in permanent damage to the processor and/or data loss.

CAUTION: Processors on the same processor board MUST be installed in matched frequency.

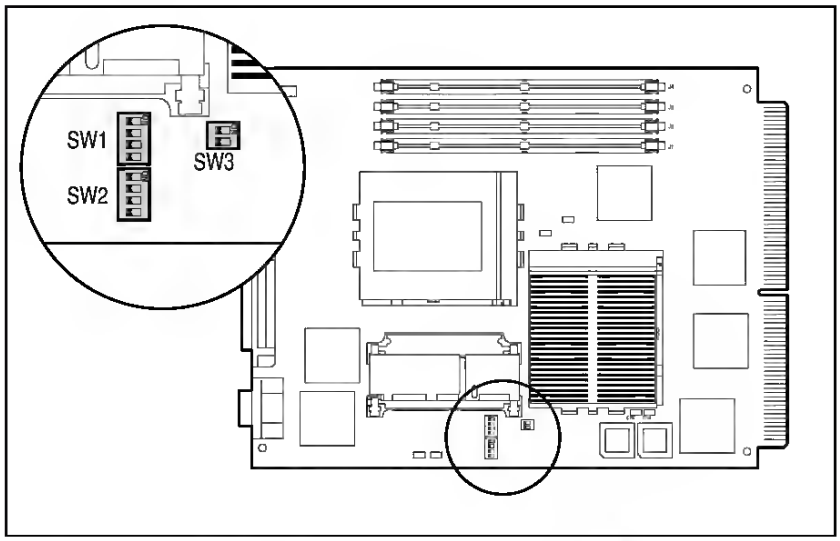

Figure 4-2. Location of Pentium Pro Processor Board Switches

The following section defines the functions for switchbanks 1 to 3 on the processor board. The default positions are indicated in Table 4-2.

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SW1, SW2, SW3 - Bus/Core Frequency Ratio

Table 4-2
SW1, SW2, SW3 - Bus/Core Frequency Ratio

	SW1 and SW2				SW3	
Bus/Core Ratio	**1**	**2**	**3**	**4**	**1**	**2**
60 MHz/120 MHz	ON	ON	ON	ON	ON	OFF
60 MHz/150 MHz	ON	ON	ON	OFF	ON	OFF
60 MHz/180 MHz	ON	ON	OFF	ON	ON	OFF
60 MHz/210 MHz	ON	ON	OFF	OFF	ON	OFF
60 MHz/240 MHz	ON	OFF	ON	ON	ON	OFF
60 MHz/270 MHz	ON	OFF	ON	OFF	ON	OFF
60 MHz/300 MHz	ON	OFF	OFF	ON	ON	OFF
60 MHz/330 MHz	ON	OFF	OFF	OFF	ON	OFF
66 MHz/133 MHz	ON	ON	ON	ON	OFF	ON
66 MHz/166 MHz	ON	ON	ON	OFF	OFF	ON
66 MHz/200 MHz (default)	ON	ON	OFF	ON	OFF	ON
66 MHz/233 MHz	ON	ON	OFF	OFF	OFF	ON
66 MHz/266 MHz	ON	OFF	ON	ON	OFF	ON
66 MHz/300 MHz	ON	OFF	ON	OFF	OFF	ON
66 MHz/333 MHz	ON	OFF	OFF	ON	OFF	ON
66 MHz/366 MHz	ON	OFF	OFF	OFF	OFF	ON

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SCSI Devices

The Compaq ProLiant 2500 supports both hot-pluggable and non-hot-pluggable SCSI hard drives. The Compaq ProLiant 2500R supports only hot-pluggable SCSI hard drives.

Mass Storage for Hot-Pluggable Models

The Hot-Pluggable Fast-Wide SCSI-2 hard drive automatically sets the SCSI ID when plugged into the Compaq ProLiant 2500 Family of Servers. If the drives are part of a fault tolerant configuration, the replaced drive will automatically begin rebuilding when it is installed.

> **NOTE:** It is not necessary to set the SCSI ID jumpers on a replacement drive. The SCSI ID is set automatically by the backplane board when the drive is installed.

The Integrated Wide-Ultra SCSI Controller requires that a SCSI ID be set for each SCSI device. The SCSI ID is set by jumpers ID2, ID1, and ID0 located on each SCSI device. Table 4-3 shows the jumper settings for each SCSI ID and its recommended drive bay. Figure 4-3 shows the physical locations of jumpers ID2, ID1, and ID0 on supported options.

Table 4-3
Jumper Settings for SCSI ID

Device in Drive Bay	SCSI ID	Bit 2 ID2	Bit 1 ID1	Bit 0 ID0
6	6	ON	ON	OFF
5	5	ON	OFF	ON

NOTE: SCSI IDs for bays 0-4 are preset to 0-4 respectively. No two devices can have the same SCSI ID.

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Mass Storage for Duplexed Hot-Pluggable Models

Table 4-4 shows the jumper settings for each SCSI ID and its recommended drive bay. Figure 4-3 shows the physical locations of jumpers ID2, ID1, and ID0 on supported options.

Table 4-4
Jumper Settings for SCSI ID

Device in Drive Bay	SCSI ID	Bit 2 ID2	Bit 1 ID1	Bit 0 ID0
5	5	ON	OFF	ON
4	4	ON	OFF	OFF

NOTE: SCSI IDs for bays 0-3 are preset to 0-3 respectively. No two devices can have the same SCSI ID.

Mass Storage for Non-Hot-Pluggable Models

The Integrated Wide-Ultra SCSI Controller requires that a SCSI ID be set for each SCSI device. The SCSI ID is set by jumpers ID2, ID1, and ID0 located on each SCSI device. Table 4-5 shows the jumper settings for each SCSI ID and its recommended drive bay. Figure 4-3 shows the physical locations of jumpers ID2, ID1, and ID0 on supported options.

Table 4-5
Jumper Settings for SCSI ID

Device in Drive Bay	SCSI ID	Bit 2 ID2	Bit 1 ID1	Bit 0 ID0
5	5	ON	OFF	ON
4	4	ON	OFF	OFF
3	3	OFF	ON	ON
2	2	OFF	ON	OFF
1	1	OFF	OFF	ON
0	0	OFF	OFF	OFF

NOTE: No two devices can have the same SCSI ID.

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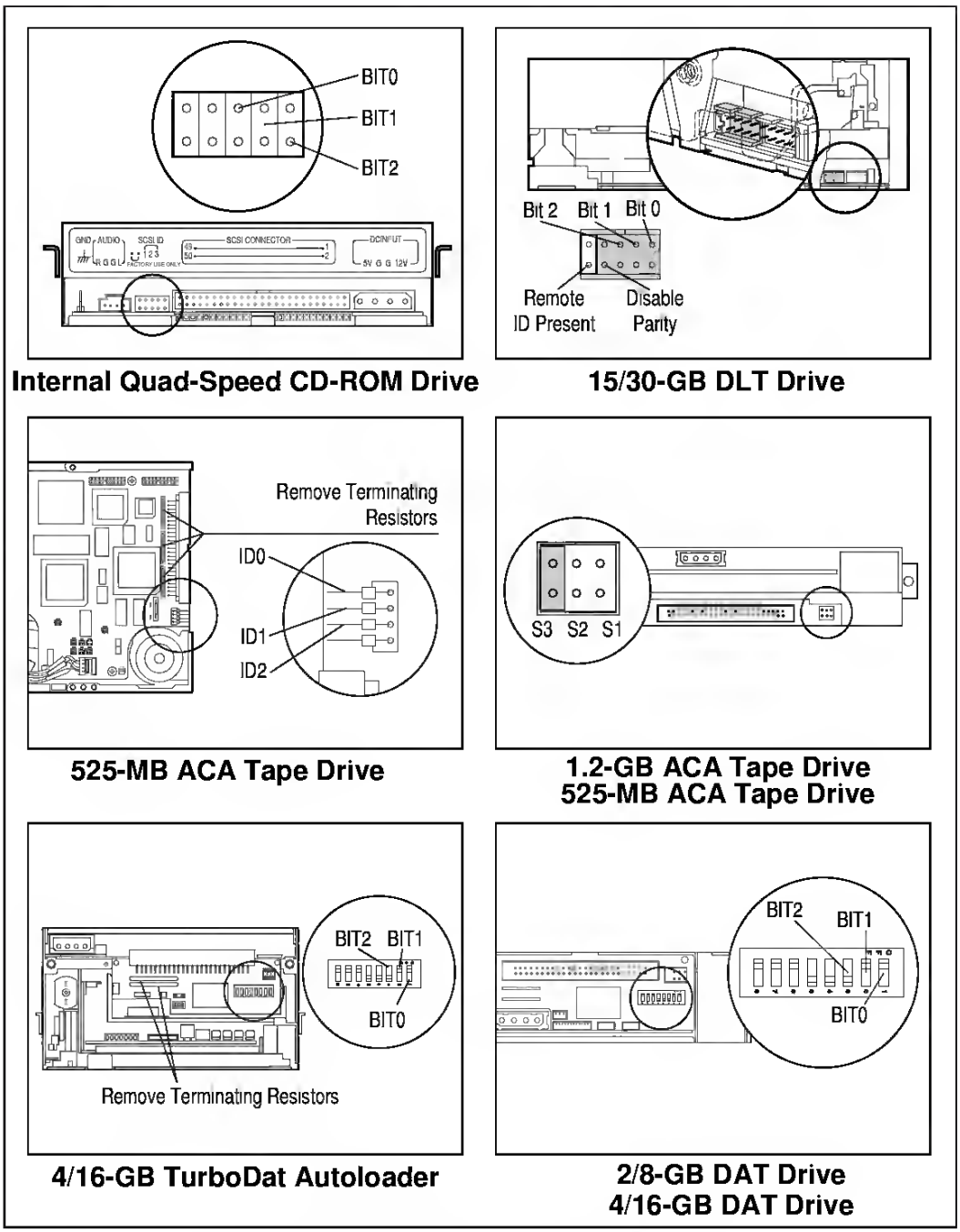

Figure 4-3. Supported SCSI Options Jumper Locations

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NetFlex-2 Controller

The Compaq NetFlex-2 Controller has one jumper block, which selects either Ethernet or Token Ring.

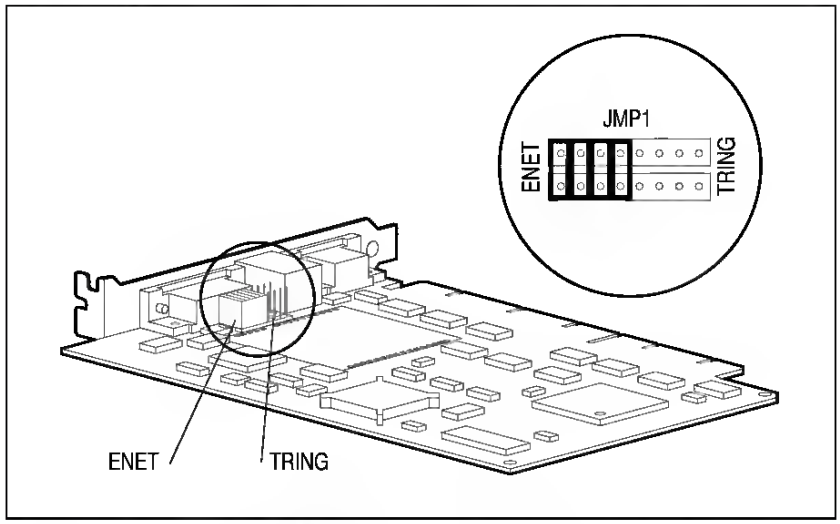

Figure 4-4. Location of 32-Bit NetFlex-2 Controller Jumpers for Ethernet

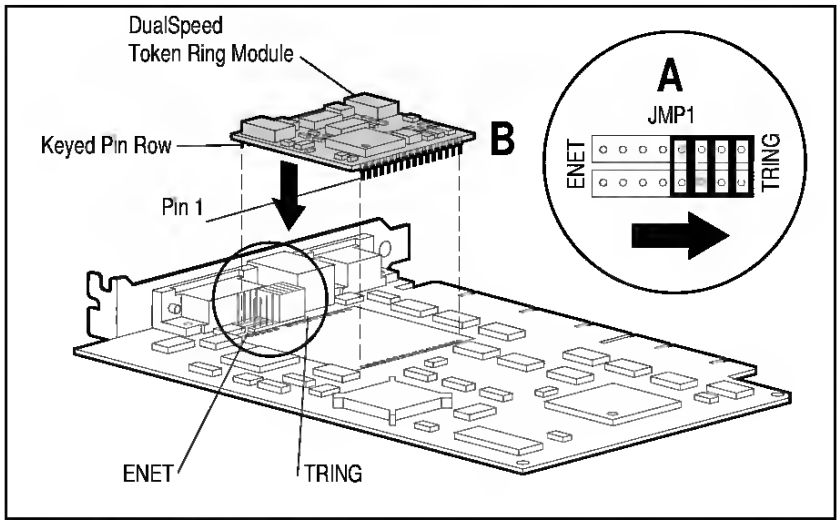

Figure 4-5. Location of 32-Bit NetFlex-2 Controller Jumpers for Token Ring

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Chapter 5
Physical and Operating Specifications

This section provides operating and performance specifications for Compaq ProLiant 2500 and 2500R Servers and optional hardware.

- System Unit
- Power Supply
- Memory
- 19-Inch Rack
- Diskette Drives
- CD-ROM Drives
- Controllers
- Hard Drives
- Network Controllers
- Network Cabling

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System Unit

Compaq ProLiant 2500

Table 5-1
System Unit Specifications -
Compaq ProLiant 2500

Dimensions		
Height	17.92 in	45.52 cm
Depth	22.67 in	57.58 cm
Width	8.83 in	22.43 cm
Weight		
No Drives Installed	50.0 lb	22.68 kg
Input Requirements		
Rated Input Voltage	100 to 240 VAC	
Rated Input Frequency	50 - 60 Hz	
Rated Input Current	6 - 3 A	
Power Supply Output Power		
Rated Steady-State Power	325 W	
Maximum Peak Power	425 W	
Temperature Range		
Operating	50° to 95° F	10° to 35° C
Shipping	-22° to 122° F	-30° to 50° C
Relative Humidity (noncondensing)		
Operating	8% to 90%	8% to 90%
Nonoperating	5% to 95%	5% to 95%
Maximum Wet Bulb Temperature	101.7° F	38.7° C

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Compaq ProLiant 2500R

Table 5-2
System Unit Specifications -
Compaq ProLiant 2500R

Dimensions		
Height	8.67 in	22.02 cm
Depth	22.75 in	57.78 cm
Width	19.0 in	48.26 cm
Weight		
No Drives Installed	50.0 lb	22.68 kg
Input Requirements		
Rated Input Voltage	100 to 240 VAC	
Rated Input Frequency	50 - 60 Hz	
Rated Input Current	6 - 3 A	
Power Supply Output Power		
Rated Steady-State Power	325 W	
Maximum Peak Power	425 W	
Temperature Range		
Operating	50° to 95° F	10° to 35° C
Shipping	-22° to 122° F	-30° to 50° C
Relative Humidity (noncondensing)		
Operating	8% to 90%	8% to 90%
Nonoperating	5% to 95%	5% to 95%
Maximum Wet Bulb Temperature	101.7° F	38.7° C

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Power Supply

Table 5-3
Power Supply Specifications

Input Specifications		
Nominal Line Voltage	100 to 120 VAC	220 to 240 VAC
Range Input Line	90 to 132 VAC	180 to 270 VAC
Frequency Range	47 to 63 Hz	47 to 63 Hz
Power Factor	0.95	0.95
Input Power	480 W	480 W
Input Current	4.0 at 120 VAC	2.0 at 240 VAC
Inrush Current	80 A at 132 VAC (cold start)	80 A at 264 VAC (cold start)
Holdup Time	20 ms from zero crossing at 120 VAC	20 ms from zero crossing at 240 VAC
General Specifications		
Full Output Rating	To 40°C and 5,000 ft	
	To 32°C and 10,000 ft (derate linearly)	
Minimum Load	4.5 A on + 5V output; 0.4A on +12V output	
Ambient Temperature Range		
Operating	50° to 122° F	10° to 40° C
Storage	-40° to 149° F	-40° to 65° C
Dielectric Voltage Withstand		
Input to Output	3000 VAC/minute	
Input to Ground	1500 VAC/minute	
Safety Standard	UL 1950; CSA 22.2 #950 or CSA 22.2 #234; TUV/VDE EN 60 950 (VDE0805/11.91); EMKO-TUE (74-SEC) 203/91	
EMI	3 dB below CISPR Publication 22 Class B; 6 dB below BMPT - AmtsblVfg 243/1991 limits; 6 dB below CFR 47, Part 15 Class B limits.	
Input Transient Susceptibility:		
Common and Differential Mode (superimposed on AC line) Differential Mode	2500V, 1 µs, damped sinusoid 600V, 10 µs pulse 20% step change in AC input voltage	

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DIMM Memory

Table 5-4
DIMM Memory Specifications

Size	32, 64, 128, 256 MB
Speed	60 ns
Width	72 Bits
Upgrade Requirement	Any pair of matched DIMMs

NOTE: Use only 32-, 64-, 128-, or 256-megabyte; EDO- or FASTPAGE-buffered; 4-K refreshed DIMMs. DIMMs must be 60-ns or faster. Use Compaq DIMMs or JEDEC-compliant DIMMs only.

19-Inch Rack

Table 5-5
19-Inch Rack Specifications

42U Rack		
Dimensions		
Height (Total Cabinet)	85.30 in	216.66 cm
Height (Cabinet Opening)	73.50 in (42U)	186.69 cm
Depth	33.50 in	85.09 cm
Width	24.00 in	60.96 cm
Weight	253 lb	114.84 kg
22U Rack		
Dimensions		
Height (Total Cabinet)	50.29 in	127.73 cm
Height (Cabinet Opening)	38.50 in (22U)	97.79 cm
Depth	33.50 in	85.09 cm
Width	24.00 in	60.96 cm
Weight	176 lb	79.89 kg

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Internal Diskette Drives

Table 5-6
Internal Diskette Drives Specifications

	1.44-MB (standard)
Size	3 1/2-inch
LED Indicators (front panel)	Green
Read/Write Capacity per Diskette (high/low density)	1.44 MB/720 KB
Drive Supported	One
Drive Height	One-third
Drive Rotation (rpm)	300
Transfer Rate bits/sec (high/low)	500 K/250 K
Bytes/Sector	512
Sectors/Track (high/low)	18/9
Tracks/Side (high/low)	80/80
Access Times:	
Track-to-Track (high/low)	3 ms/8 ms
Average (high/low)	169/94 ms
Settling Time	15 ms
Latency Average	100 ms
Cylinders (high/low)	80/80
Read/Write Heads	Two

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CD-ROM Drive

Table 5-7
CD-ROM Drive Specifications

Capacity		680 MB or greater, dependent on disc format
Dimensions (excluding projections)		
External		
Height	1.9 in	4.9 cm
Depth	1.3 in	3.3 cm
Width	7.01 in	17.8 cm
Internal		
Height	1.7 in	4.3 cm
Depth	0.8 in	2.1 cm
Width	5.9 in	14.9 cm
Weight		
External CD-ROM	6 lb 6 oz	2.85 kg
Internal CD-ROM	1 lb 2 oz	1.25 kg
Data Transfer Rate		
Sustained		300 or 150 Kbytes/sec
Asynchronous		2.5 MB/s
Synchronous		4.0 MB/s
Access Times		
Full Stroke		520 ms
One-Third Stroke		290 ms
Cache/Buffer		256 Kbytes (minimum)
Audio Output Level		
Line Out		0.7 VRMS at 47 kohms
Headphone		0.55 VRMS at 32 ohms (at maximum volume)

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Tray Load CD-ROM Drive

Table 5-8
Tray Load CD-ROM Drive Specifications

Dimensions (excluding projections)		
Height	1 11/16 in	42.5 cm
Depth	8 in	202.4 cm
Width	5 3/4 in	148.5 cm
Weight	2 lb 12 oz	1.25 kg
Laser Specifications		
Beam Divergence	53.4° +/- 1.5°	
Output Power	0.6 mW	
Type	Semiconductor laser GaAlAs	
Wave Length	780 nm	
Drive Performance		
Access Time		
One Third Stroke	350 ms	
Full Stroke	600 ms	
Audio Output Level		
Line Out	0.8 V_{RMS} at 47 kΩ	
Headphone	0.6 V_{RMS} at 32 kΩ (maximum volume)	
Cache/Buffer	256 Kbytes	
Data Transfer Rate		
Sustained	300 or 150 Kbytes/sec	
Asynchronous	2.5 MB/s	
Synchronous	4.0 MB/s	
Interface Cable Length	6 m (approximately 18 ft maximum)	
Reliability		
Start Up Time	< 7 seconds	
Stop Time	< 3 seconds	
Environmental Conditions		
Operating		
Temperature	5° to 45° C	
Humidity	10 to 90%	
Absolute Humidity	30 grams/m^3 (maximum wet bulb temp is 29° C)	
Atmosphere	Noncondensing	
Nonoperating/Transportation		
Temperature	-20° to 55° C	
Humidity	5 to 90%	
Atmosphere	Noncondensing	
Power Requirement	100-240 VAC, 50/60 Hz	
Power Consumption	0.28 A	

Continued

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Tray Load CD-ROM *Continued*	
Environmental Conditions (*continued*)	
Shock	
Operating	5 G0-P at 11 ms half sine wave
Nonoperating	40 G0-P at 11 ms half sine wave
Transportation	76 cm drop (with standard package)
Vibration	
Operating	0.15 G0-P at 5 to 300 Hz
Nonoperating	2 G0-P at 5 to 300 Hz
Transportation	0.015 G^2/Hz at 5 to 50 Hz (with standard package)

Integrated Wide-Ultra SCSI Controller

Table 5-9
Wide-Ultra SCSI Controller Specifications

Drives Supported	Up to 5
Data Transfer Method	32-Bit PCI bus master
Host Bus Transfer Rate	132 MB/s
SCSI Transfer Rate	40 MB/s
External SCSI Connector	68-pin Wide-Ultra SCSI
Internal SCSI Connector	68-pin Wide-Ultra SCSI

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Wide-Ultra SCSI Controller

Table 5-10
Wide-Ultra SCSI Controller

Drives Supported	Up to 7 total (internal and external)
Data Transfer Method	32-bit bus master
SCSI Channel Transfer Rate	40 MB/s
Maximum Transfer Rate on PCI Bus	132 MB/s
SCSI Termination	Active termination
External SCSI Connector	68-Pin wide SCSI Connector
Internal SCSI Connector	50-Pin Fast-SCSI-2 Connector 68-Pin wide SCSI Connector

32-Bit Fast-SCSI-2/E Controller

Table 5-11
32-Bit Fast-SCSI-2/E Controller Specifications

Dimensions		
Height	4.5 in	11.43 cm
Depth	0.375 in	0.95 cm
Width	10.5 in	26.67 cm
Total Weight	7.13 oz	205 g
Drives Supported		Up to 7 total (internal and external)
Data Transfer Method		32-bit bus master
SCSI Channel Transfer Rate		10 MB/s
Maximum Transfer Rate on EISA Bus		33 MB/s
SCSI Termination		Active termination
External SCSI Connector		50-Pin SCSI-2 Connector
Internal SCSI Connector		50-Pin Port Connector 50-Pin Termination Connector

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32-Bit Fast-Wide SCSI-2/E Controller

Table 5-12
32-Bit Fast-Wide SCSI-2/E Controller Specifications

Dimensions		
Height	4.5 in	11.43 cm
Depth	0.375 in	0.95 cm
Width	10.5 in	26.67 cm
Total Weight	7.13 oz	205 g
Drives Supported	Up to 7 total (internal and external)	
Data Transfer Method	32-bit busmaster	
SCSI Channel Transfer Rate	20 MB/s	
Maximum Transfer Rate on EISA Bus	33 MB/s	
SCSI Termination	Active termination	
External SCSI Connector	68-Pin wide SCSI Connector	
Internal SCSI Connector	50-Pin Fast-SCSI-2 Connector 68-Pin wide SCSI Connector	

32-Bit Fast-Wide SCSI-2/P Controller

Table 5-13
32-Bit Fast-Wide SCSI-2/P Controller Specifications

Drives Supported	Up to 7 total (internal and external)
Data Transfer Method	32-bit busmaster
SCSI Channel Transfer Rate	20 MB/s
Maximum Transfer Rate on PCI Bus	132 MB/s
SCSI Termination	Active termination
External SCSI Connector	68-Pin wide SCSI Connector
Internal SCSI Connector	50-Pin Fast-SCSI-2 Connector 68-Pin wide SCSI Connector

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SMART-2/P Controller

Table 5-14
SMART-2/P Controller Specifications

Dimensions		
Height	3.9 in	9.9 cm
Length	13.75 in	34.9 cm
Thickness (including Array Accelerator)	0.60 in	1.5 cm
Total Weight (including Array Accelerator)	N/A	N/A
Temperature Range		
Operating	50° to 95°F	10° to 35°C
Shipping	-22° to 140°F	-30° to 60°C
Relative Humidity (non condensing)		
Operating	20% to 80%	20% to 80%
Non-operating	5% to 90%	5% to 90%
Power Required		
+5V	2.6 amps	
+12V	20 ma	
-12V	20 ma	
Heat Dissipated (maximum)	13.5 watts	
SCSI Channels	2	
Drives Supported (maximum, internal and external)	14	
Data Transfer Method	32-Bit bus master	
SCSI Bus Transfer Rate (maximum)	20 MB/sec (10 MHz)	
PCI Bus Transfer Rate (maximum)	132 MB/sec	
SCSI Bus Termination	Required	
SCSI Port Connectors (internal and external)	68-pin Fast-Wide SCSI-2	

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SMART-2/E Controller

Table 5-15
SMART-2/E Controller Specifications

Dimensions		
Height	4.5 in	11.4 cm
Length	13.5 in	34.3 cm
Thickness (including Array Accelerator)	0.6 in	1.5 cm
Total Weight (including Array Accelerator)	N/A	N/A
Temperature Range		
Operating	50° to 95°F	10° to 35°C
Shipping	-22° to 140°F	-30° to 60°C
Relative Humidity (non condensing)		
Operating	20% to 80%	20% to 80%
Non-operating	5% to 90%	5% to 90%
Power Required		
+5V	3.0 a	
+12V	20 ma	
-12V	20 ma	
Heat Dissipated (maximum)	15.5 watts	
SCSI Channels	2	
Drives Supported (maximum, internal and external)	14	
Data Transfer Method	32-Bit Bus Master	
SCSI Bus Transfer Rate (maximum)	20 MB/sec (10 MHz)	
EISA Bus Transfer Rate (maximum)	33 MB/sec	
SCSI Bus Termination	Required	
SCSI Port Connectors (internal and external)	68-pin Fast-Wide SCSI-2	

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SMART SCSI Array Controller

Table 5-16
SMART SCSI Array Controller Specifications

Drives Supported	Up to 14
Data Transfer Method	32-Bit Bus Master
Maximum Transfer Rate on EISA Bus	33 MB/s
Simultaneous Drive Transfer Channels	2
Reliability Features	
Drive Mirroring	Yes
Data Guarding	Yes
Distributed Data Guarding	Yes
N+1 Distributed Data Guarding	Yes
On-Line Spare	Yes
Drive Failure Alert System	LED Indicators, Compaq Insight Manager
Cache Memory for Accelerator	4 MB Mirrored
Batteries	Yes
Battery Capacity without Power	3 - 4 days
Charge	Trickle

2.1-Gigabyte Pluggable Fast-Wide SCSI-2 Drive

Table 5-17
2.1-Gigabyte Pluggable Fast-Wide SCSI-2 Drive Specifications

Capacity	2104.3 MB
Block Size	512 Bytes
Interface	Single-Ended Fast-Wide SCSI-2
Synchronous Transfer	Up to 20 MB
Buffer Size	256 Kbytes
RPM	7200 rpm
Average Access	9.0 ms

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4.3-Gigabyte Pluggable Fast-Wide SCSI-2 Drive

Table 5-18
4.3-Gigabyte Pluggable Fast-Wide SCSI-2 Drives Specifications

Capacity	4293.6 MB
Block Size	512 Bytes
Interface	Single-Ended Fast-Wide SCSI-2
Synchronous Transfer	Up to 20 MB
Buffer Size	512 Kbytes
RPM	7200 rpm
Average Access	9.0 ms

NetFlex-2 ENET-TR Controller

Table 5-19
NetFlex-2 ENET-TR Controller Specifications

Dimensions		
Height	5.1 in	12.9 cm
Depth	7.4 in	18.8 cm
Width	0.51 in	1.3 cm
Total Weight		
Ethernet Configuration	5.44 oz	150 g
Token Ring Configuration	5.76 oz	170 g
Processor	TI TMS380C26	
Coprocessor	TI Packet Blaster (TMS380FPA)	
Data Transfer Method	32-bit EISA busmaster	
Maximum Transfer Rate on EISA bus	933 MB/s	
Standard Network Controller Configuration - Ethernet		
Meets IEEE 802.3 Specifications		
Supports AUI (DB-15)		
Supports 10BaseT (RJ-45)		
Supports Optional AUI to BNC Adapter		
Optional Network Controller Configuration - Token Ring		
Meets IEEE 802.5 Specifications on STP cable		
Meets proposed specifications on STP cable		
Supports Token Ring Interface (4- or 16-megabit per second data transfer rates)		
Supports STP (DB-9)		

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Supports UTP (RJ-45)

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NetFlex-3/E Controller

Table 5-20
Compaq NetFlex-3/E Controller Specifications

Dimensions		
Height	0.75 in	1.91 cm
Length	8.2 in	20.7 cm
Width	5.0 in	12.7 cm
Total Weight	5.76 oz	159 g
Network Controller Chipset	TI ThunderLAN	
Data Transfer Method	32-Bit EISA Busmaster	
Interrupts Supported	5, 9, 10, and 11	
LEDs	Link and Network Activity	

Netflex-2 DualPort ENET Controller

Both network interfaces share a common 26-pin D-Shell connector to support AUI. To convert this connector to two AUI ports, a special cable (that ships with the option) is required.

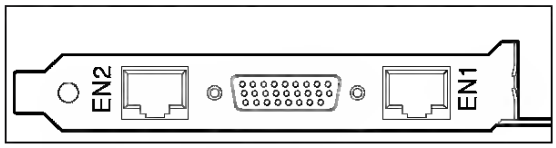

Figure 5-1. D-Shell Connector

Table 5-21
NetFlex-2 DualPort ENET Controller Specifications

Network Interface	Two Ethernet interfaces on a single controller card
Expansion Bus	32-Bit Extended Industry Standard Architecture (EISA)
Data Transfer Method	32-Bit Bus Master
Network Bit Rate	10 Mbits/sec
Connectors	Two RJ-45 connectors and two AUI or BNC connections (converter cable)
Processor	Texas Instruments TMS380C26 Super Eagle
Coprocessor	Texas Instrument Packet Blaster TMS380FPA

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Ethernet Cable (10/100BASE-T)

Table 5-22
Ethernet Cable Specifications Twisted Pair (10/100BASE-T)

Connector type:	RJ-45, 8-pin
Cable type:	Unshielded twisted pair (UTP) 22-26AWG, 100 Ohm @1 MHz
Distance:	Up to 100 meters from node to concentrator

Ethernet Cable (AUI)

Table 5-23
Ethernet Cable Specifications (AUI)

Connector type:	DB-15
Cable type:	AUI cable to external transceiver
Distance:	Up to 50 meters between network controller and the Medium Attachment Unit (MAU)

Token Ring Cable (STP)

Table 5-24
Token Ring Cable Specifications Shielded Twisted Pair (STP)

Connector type:	DB-9
Cable type:	All cable types that meet the IEEE 802.5 requirements

Token Ring Cable (UTP)

Table 5-25
Token Ring Cable Specifications Unshielded Twisted Pair (UTP)

Connector type:	RJ-45
Cable type:	All cable types that meet the IEEE 802.5 requirements

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